

## ATTACHMENT 3: WORK PLAN

### Introduction

**Project Overview.** This project, *Stormwater Source Control in the CABY Region*, will construct green infrastructure stormwater facilities to reduce sediment, pollutants, and erosive peak flows, while increasing groundwater infiltration and storage in the Yuba River watershed. It will also provide a highly exportable, innovative solution for controlling downstream flood risk. The project will be constructed at two public sites in the disadvantaged communities of Nevada City and Grass Valley—the Nevada County Rood Administrative Center (Rood Center) and the Yuba River Charter School (YRCS)<sup>1</sup>.

Green infrastructure<sup>2</sup> is a network of decentralized stormwater management practices such as green roofs, trees, rain gardens, and permeable pavement. These practices capture and infiltrate rain where it falls, thus reducing stormwater runoff and improving the health of the surrounding waterway. The ability of these practices to deliver multiple ecological, economic and social benefits or services has made green infrastructure an increasingly popular strategy in recent years.<sup>3</sup> The proposed demonstration project is aimed at bringing these multiple benefits to the Yuba Watershed and beyond.

Construction of green infrastructure at the Rood Center will include three rain gardens, a vegetated bio-swale with underground retention system, pervious pavement parking areas and a pervious pavement walkway with interpretive signs. These features will capture and treat 6.4 million gallons of runoff annually, and will provide outreach and education for thousands of visitors at this high-use, highly visible County facility.<sup>4</sup> Green stormwater catchment elements at YRCS will include: 1) two rain gardens, 2) two vegetated swales, 3) pervious parking, walkways, and assembly areas, and 4) two retention wetlands. More than 2 million gallons of stormwater will be captured and treated each year from 160,000 square feet of parking lot and roof at YRCS.

All of these approaches mimic nature’s way of dealing with stormwater and provide not only economic, water quality and hydrology benefits, but also aesthetic and habitat values. In addition, the project has an innovative and robust monitoring component to quantitatively measure benefits, incorporates education and outreach activities for a range of audiences, and coordinates with other such efforts throughout the state to promote early learning and replication throughout the Cosumnes, American, Bear and Yuba (CABY) watersheds and the greater Sierra Nevada region.

*During an average year, the annual snow and water runoff that passes down the Yuba River is about 2.4 million acre-feet. The maximum annual runoff experienced on the river was nearly five million acre-feet.*

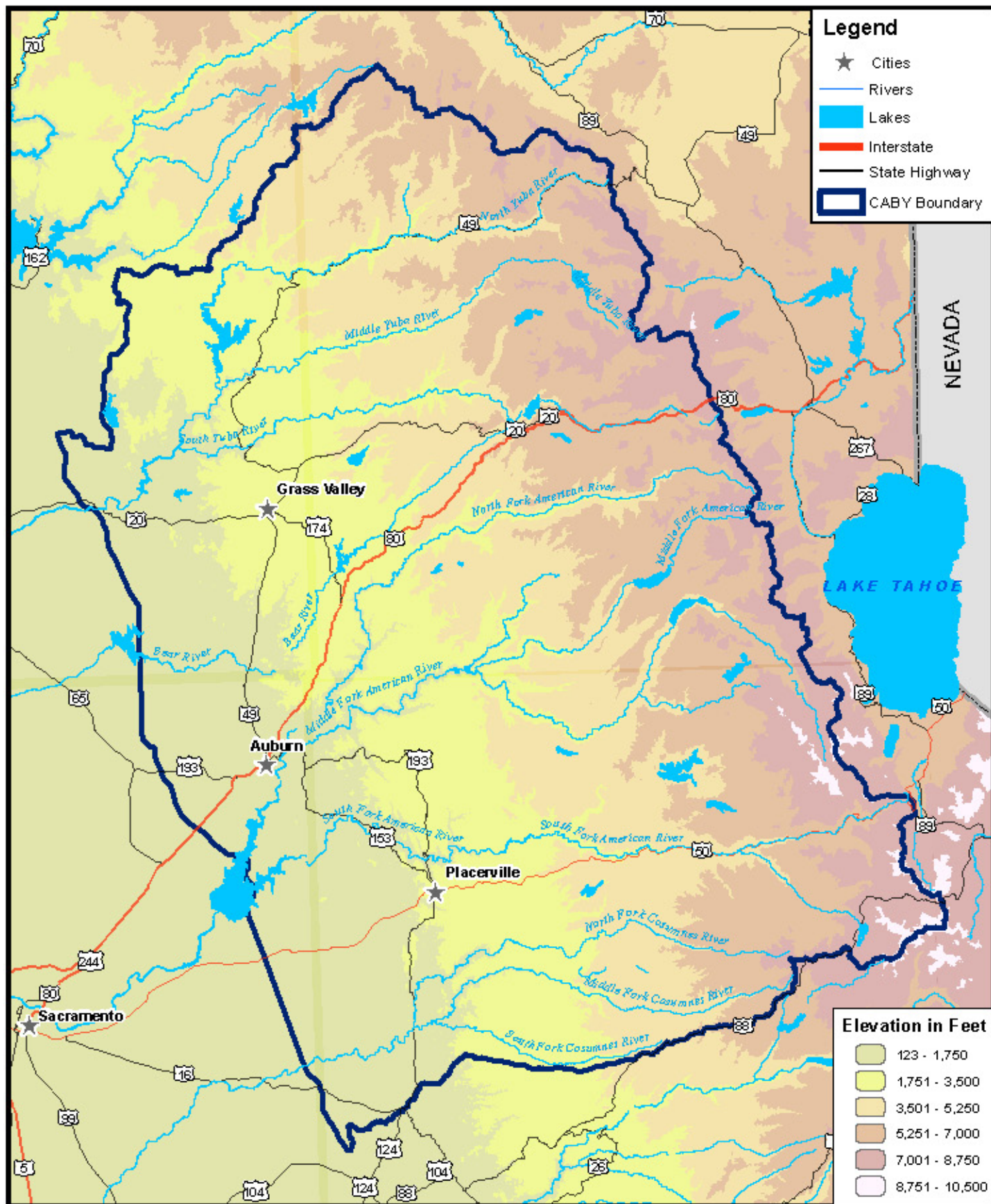
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<sup>1</sup> YRCS, once constructed, will be the first publicly-funded Waldorf-inspired Charter school in the country. Because of this distinction and the unique design of the school, the school will receive many visitors. Staff and faculty at YRCS are enthused about how the proposed green infrastructure elements both fit into the philosophy of the school and will allow them to demonstrate their commitment to sustainable resource practices.

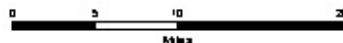
<sup>2</sup> Green infrastructure is a form of Low Impact Development (LID) that focuses on capturing and treating stormwater.

<sup>3</sup> CNT and American Rivers. 2010. The Value of Green Infrastructure.  
<http://www.americanrivers.org/library/reports-publications/the-value-of-green-infrastructure.html>

<sup>4</sup> The parking lot at the Rood Center is the largest lot in the surrounding area.



CABY Region

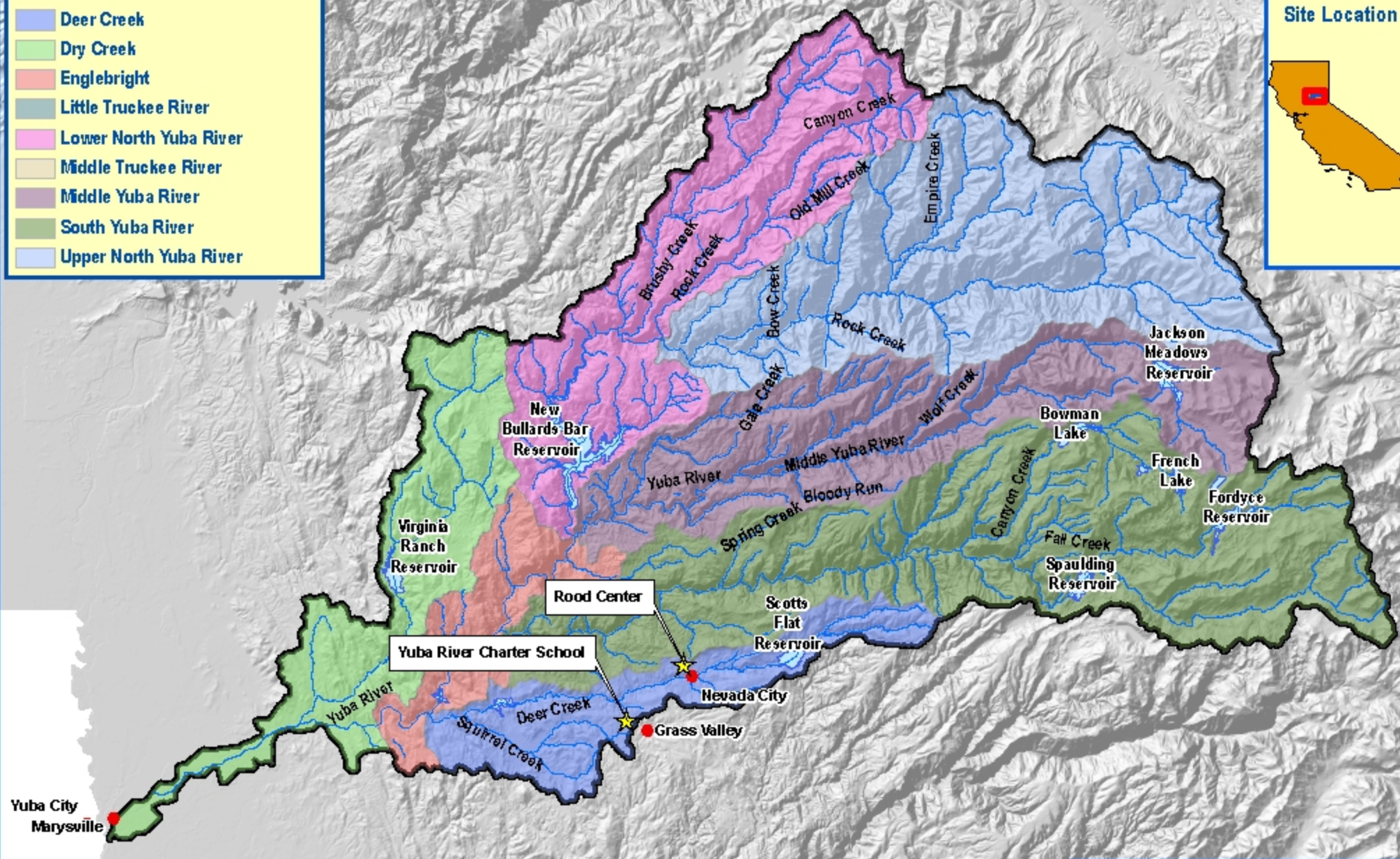




## Yuba Watershed Sub-basins

- Deer Creek
- Dry Creek
- Englebright
- Little Truckee River
- Lower North Yuba River
- Middle Truckee River
- Middle Yuba River
- South Yuba River
- Upper North Yuba River

## Site Location

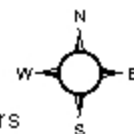


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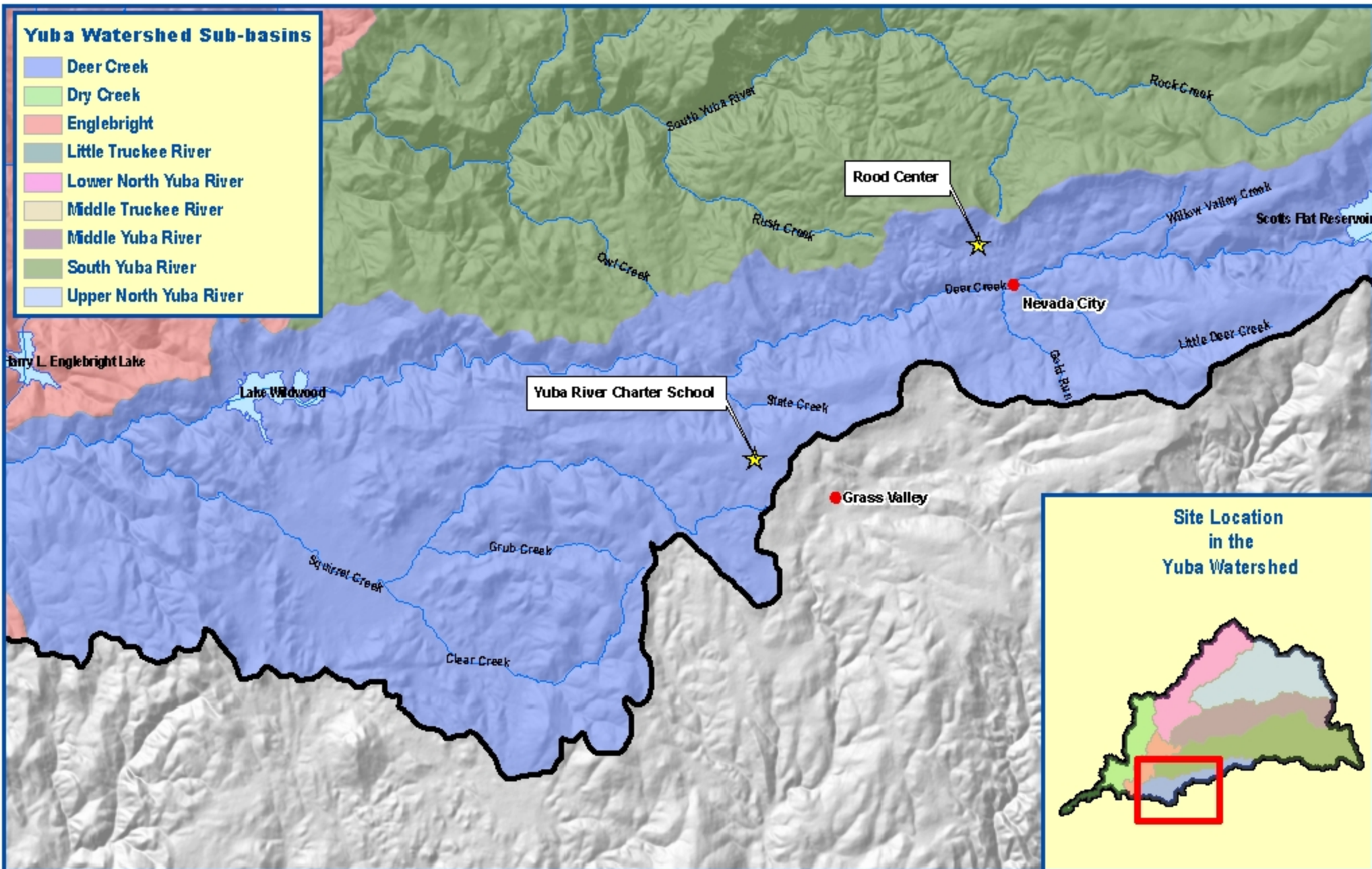


- Yuba Watershed Boundary
- Waterways
- Waterbodies
- Major Cities



# Yuba Watershed Sub-basins

- Deer Creek
- Dry Creek
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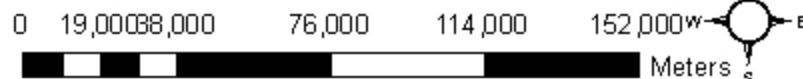


## Site Location in the Yuba Watershed



Date Created: April 2011

Created By:



- Yuba Watershed Boundary
- Project Sites
- Major Cities
- Waterways
- Waterbodies





PANEL 0627E

# FIRM

## FLOOD INSURANCE RATE MAP

NEVADA COUNTY,  
CALIFORNIA  
AND INCORPORATED AREAS

PANEL 627 OF 800

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

### CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
GRASS VALLEY CITY OF NEVADA COUNTY	06057	0627	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER

06057C0627E

EFFECTIVE DATE

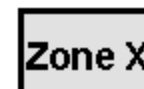
FEBRUARY 3, 2010

Federal Emergency Management Agency

## Flood Zone Delineation



100 Year



Outside 500 Year

Date Created: April 2011

Created By:



0 25 50 100 150 200 Meters





PANEL 0369E

# FIRM

## FLOOD INSURANCE RATE MAP

NEVADA COUNTY,  
CALIFORNIA  
AND INCORPORATED AREAS

PANEL 369 OF 800

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFF X
NEVADA CITY, CITY OF	060453	0100	
NEVADA COUNTY	060210	0100	

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER  
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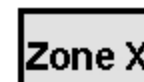
EFFECTIVE DATE  
FEBRUARY 3, 2010

Federal Emergency Management Agency

## Flood Zone Delineation



100 Year



Outside 500 Year

Date Created: April 2011

Created By:



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**Goals and Objectives.** The overall goal of this project is to reduce sediment, pollutants, and erosive peak flows while increasing water storage in the Yuba River watershed through the construction of green infrastructure stormwater facilities. Objectives in support of this goal are:

- Construct and install rain gardens, vegetated swales, pervious pavement, and retention wetlands to capture and treat approximately 6.4 million gallons of stormwater runoff annually.
- Protect water quality through the capture and infiltration of 100 percent of “first flush” runoff, which normally contains the highest pollutant concentrations
- Protect water quality through the capture and infiltration of 100 percent of runoff in approximately 90 percent of storm events
- Increase groundwater recharge by directing rainwater into the ground instead of into pipes
- Decrease erosive peak flows through control of peak runoff
- Quantify and communicate project benefits through innovative monitoring and demonstration activities
- Promote replication of green infrastructure stormwater management facilities in the Sierra headwaters through education and outreach

**Purpose and Need.** The Sierra Nevada generates approximately 20 million-acre feet of runoff in the form of river flows each year. These rivers form an immense natural and engineered water supply network providing 60 percent of the state’s water supply. They also support complex instream ecology resulting in the Sierra Nevada ranking as the world’s most ecologically rich region in terms of endemic aquatic invertebrates. Yet all is not well in the headwaters. After 145 years of exploitation, most of the Sierra’s rivers have impaired water quality and almost two-thirds of the region’s 67 aquatic habitat types are declining in quality and abundance. In addition, the Sierra, including the foothills, is subject to some of the largest drivers of change of any rural region in the United States including population growth, intense recreational use, rapid development, and climate change. These rivers, streams, and creeks are under immense pressure, and unless their ecological needs are integrated into these landscape level changes, the impact on water quality, species diversity and abundance, and general ecosystem health will be felt from the headwaters to the Bay. The central focus of this project is to demonstrate how to mitigate hydromodification impacts associated with this projected development – a critical component in addressing these watershed needs.

Conventional methods of reducing stormwater runoff present numerous problems. These engineered “solutions” such as enlarged sewer pipes, underground storage tanks, and treatment plant expansions not only cost enormous sums, but are only partially effective in solving water quality and flooding problems. In contrast to conventional methods, which treat rain as a waste product, green infrastructure techniques (such as rain gardens, natural swales, and rain barrels) help to restore a more natural hydrology to rivers by capturing rainwater, reducing flood flows, sustaining base flows during dry periods, reducing water temperatures, minimizing erosion and sedimentation, and reducing nutrient and other pollutant loads.

*Runoff adds up quickly. After an inch of rain, a 30-foot wide paved street will drain about 100,000 gallons of runoff per mile.*

In addition, the demonstration of these approaches is very timely as the latest Clean Water Act regulations<sup>5</sup> and others being considered by the California State Water Resources Control Board

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<sup>5</sup> Published in the Federal Register on December 1, 2009.

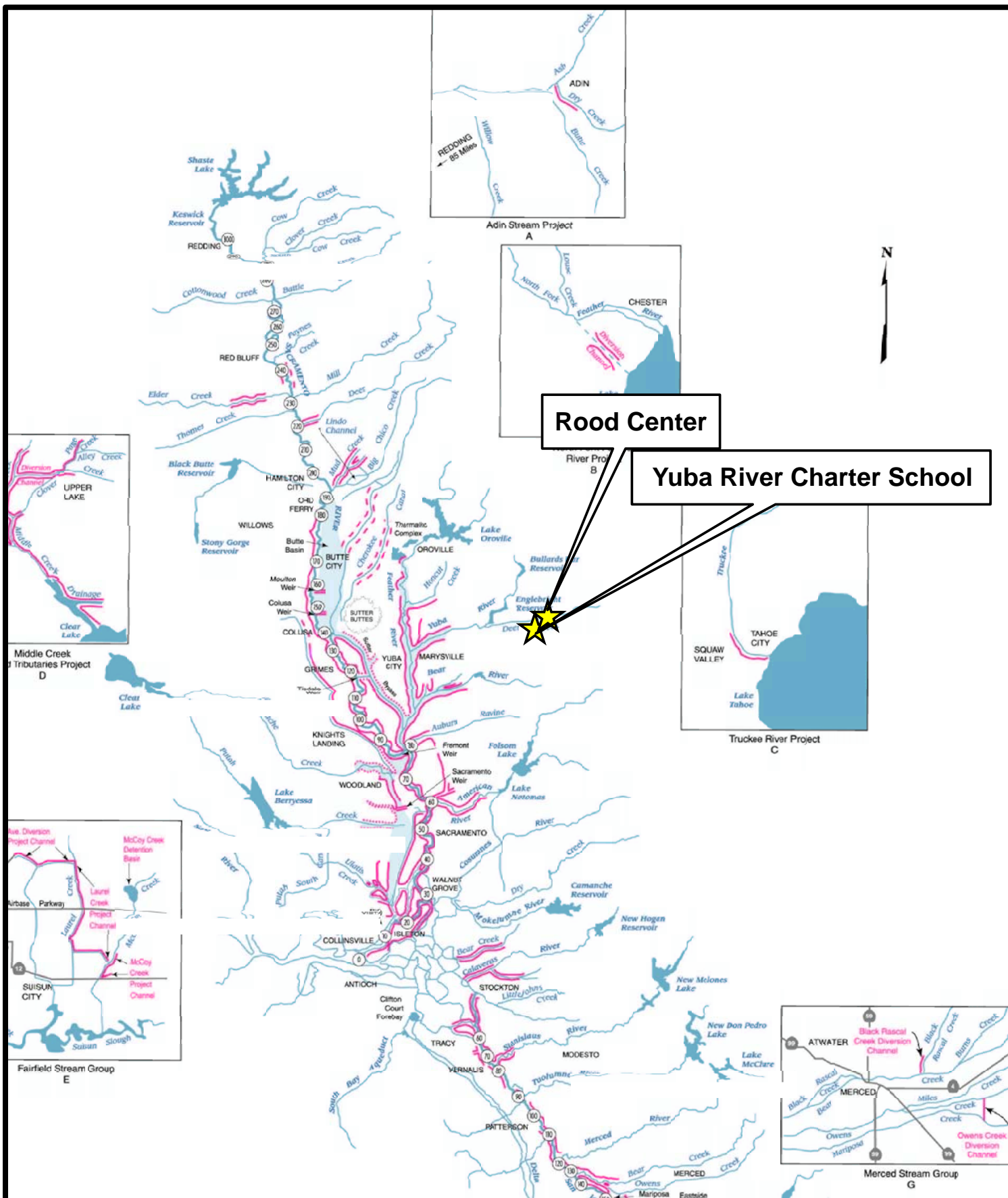
require developments to provide such source control techniques and to replicate “pre-development hydrology.” As these new regulations roll out, developers as well as homeowners will be looking for economical and effective methods to meet these new requirements. Our project is designed to help fill that gap.

Flood Risk Reduction. The communities along the Yuba River have a long history of catastrophic flooding. Major floods have been recorded since 1839, with the most recent devastating flood occurring in 1997. Many inundations have caused loss of life and significant property damage. For example, according to the U.S. Army Corps of Engineers, flooding in 1983 caused damages estimated at \$11 million (1983 dollars). The flood in February 1986 caused a fatality and forced about 24,000 people to evacuate. California settled flood claims for \$464 million (1986 dollars). The flood of 1995 caused flood damages of about \$25 million (1995 dollars) to private properties, public buildings and infrastructure, farming (crop, livestock, and nursery losses), and roads. More recently, the January 1997 flood caused one of the largest evacuations in California history, left hundreds of people homeless, tens of thousands of acres inundated, hundreds of homes damaged, and four fatalities. Property damages from this flood were estimated at \$41 million in 1997 dollars (USACE, 2008).

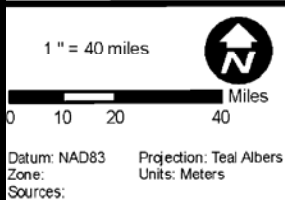
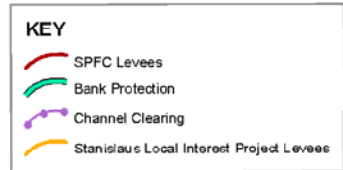
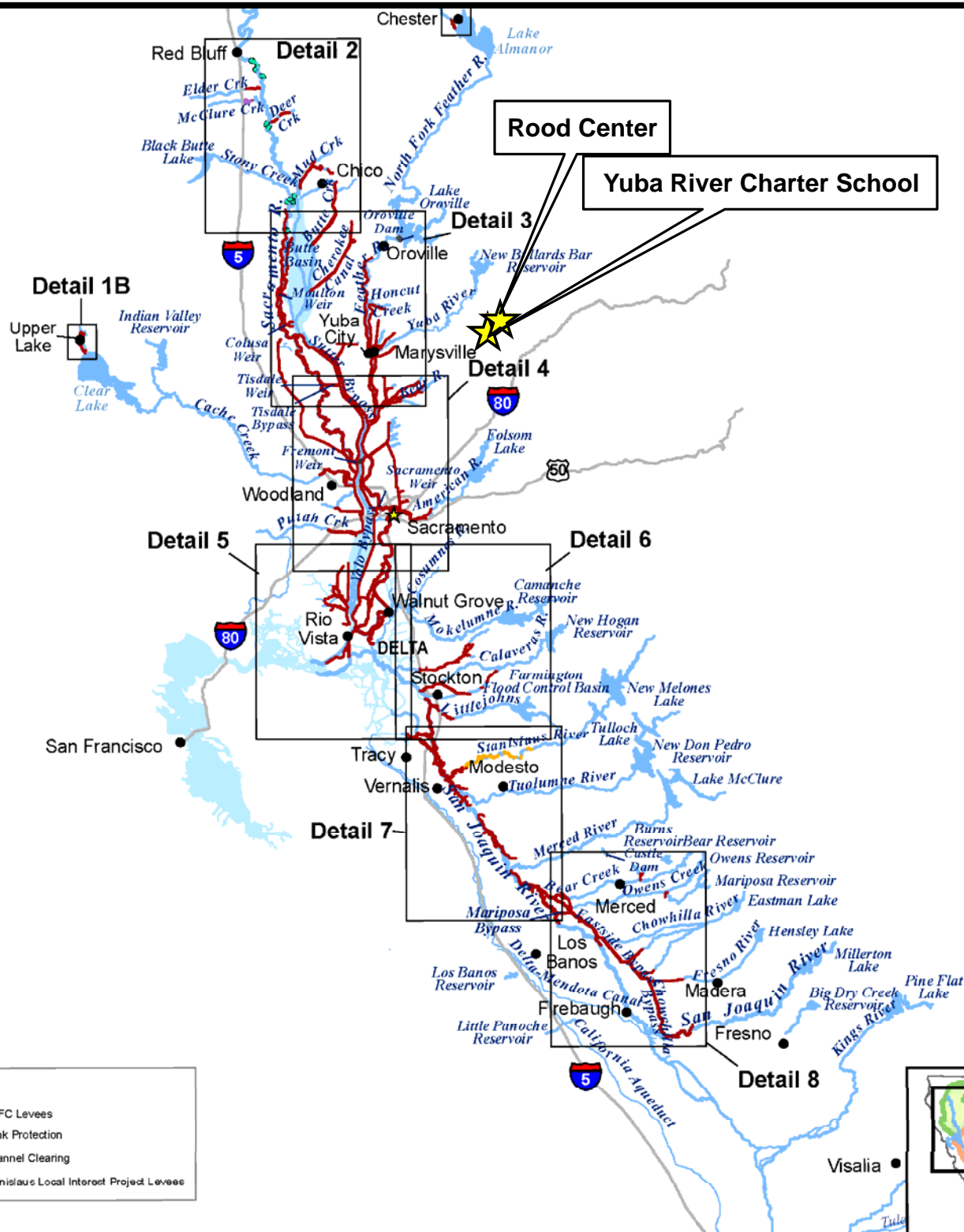
Since the early 1990s, the lower watershed has been partially protected by a flood control system of levees. Upstream storage facilities were constructed on the Yuba in 1970 in an attempt to increase flood protection. However, the current system does not provide adequate defense against flood-level flows. Creative and decentralized solutions such as green infrastructure to improving flood management are critical for the health, safety, and economic stability of communities in this region.







**Project Locations in Relation to the Sacramento & San Joaquin River Flood Control System Project Levees & Channels Map**



**State Plan of Flood Control  
Descriptive Document**

**Sacramento and San Joaquin River Basins  
Showing the Areal Extents of  
Details 1A through 8**

FloodSAFE CALIFORNIA	
DEPARTMENT OF WATER RESOURCES	STATE OF CALIFORNIA
Prepared By: M Jacobson, M Rabo	Appendix: Index Map
Job No.:	Date: October 14, 2010
File: Appendix Index Map 201010t.mxd	

**Project Locations in Relation to the  
State Plan of Flood Control  
Map**



**Sedimentation and Pollution.** Excessive sediment loading and pollutants threaten the ecology of the Yuba River Watershed. The USGS Scientific Investigations Report 2005–5246<sup>6</sup> supports the need for actions to address stormwater and sediment issues. Owing to its large drainage area, higher flows<sup>7</sup>, and absence of man-made structures that restrict sediment movement in the lower basin, the Upper Yuba River transports much larger sediment loads than other watersheds in the Sierra. In addition to sediment, these high flows rapidly transport large quantities of pollutants that originate from highways, roads, ailing sewage treatment plants and septic leaks, mining and dredging, ski resort operations, and rapid development. Additionally, the abandoned hydraulic mine pits abundant in the project area experience chronic hillslope erosion (Yuan, 1979), and therefore are significant sources of both sediment and heavy metals (Curtis et al, 2005). The Yuba Watershed is listed as impaired for mercury, and several waterways within the watershed (including Deer Creek) are listed for mercury, copper, sediment, zinc, and arsenic.

Deer Creek, a tributary to the Yuba, is an example of the watershed-wide issues with sediment and pollutants. Specific problems associated with sediment in the Deer Creek Watershed were identified in the *Upper Deer Creek Assessment and Restoration Plan*.<sup>8</sup> These include excessive fine sediment deposits; excessive nutrient loads; stormwater and other non-point source pollution inputs; and erosion on banks that contain mercury and other heavy metal contamination from past mining activities. These problems are exacerbated by rapid development in the region and increasing impervious cover.



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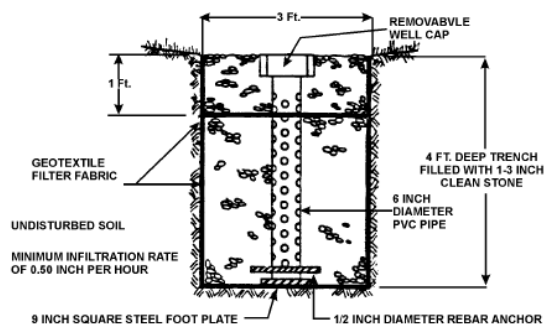
<sup>6</sup> Use of Sediment Rating Curves and Optical Backscatter Data to Characterize Sediment Transport in the Upper Yuba River Watershed, California, 2001–03.

<sup>7</sup> Peak flows in the Upper Yuba River can be 1,000 times greater than base flows.

<sup>8</sup> Upper Deer Creek Assessment and Restoration Plan, Friends of Deer Creek and Natural Heritage Institute, 2006

Green Infrastructure. As mentioned above, green infrastructure integrates better development planning with stormwater-catching landscape techniques, such as rain gardens, and can be a significant tool in solving water quality and flooding problems in the Yuba Watershed. Employing natural stormwater management techniques can be implemented immediately and is an appropriate technique for the small, headwater communities facing development pressure that require cost-effective and decentralized approaches. Rain gardens, vegetated swales, and constructed wetlands restore a more natural hydrology to rivers by sustaining base flows during dry periods, reducing water temperatures, minimizing erosion and sedimentation, and reducing nutrient and other pollutant loads. This strategy is critical to reducing downstream flood risk, ensuring a healthy riparian environment, and providing clean water for downstream use.

Vegetated Swales. Vegetated swales perform the same functions as traditional grassy swales by serving as a conveyance structure and filtering and infiltrating runoff. They differ, however, because the use of bioretention media enhances infiltration, water retention, nutrient and pollutant removal. Gravel or other permeable material that is installed below the channel bottom enhances infiltration. Native and other water-conserving plants are used in the channel as an alternative to grass. Vegetated swales are easy to design and can be incorporated into a site drainage plan. As part of this project, we will design and construct demonstration vegetated swales in the Yuba River Watershed to reduce stormwater runoff, which causes flooding and pollution. These swales will slow and infiltrate stormwater as it is routed to a rain garden.



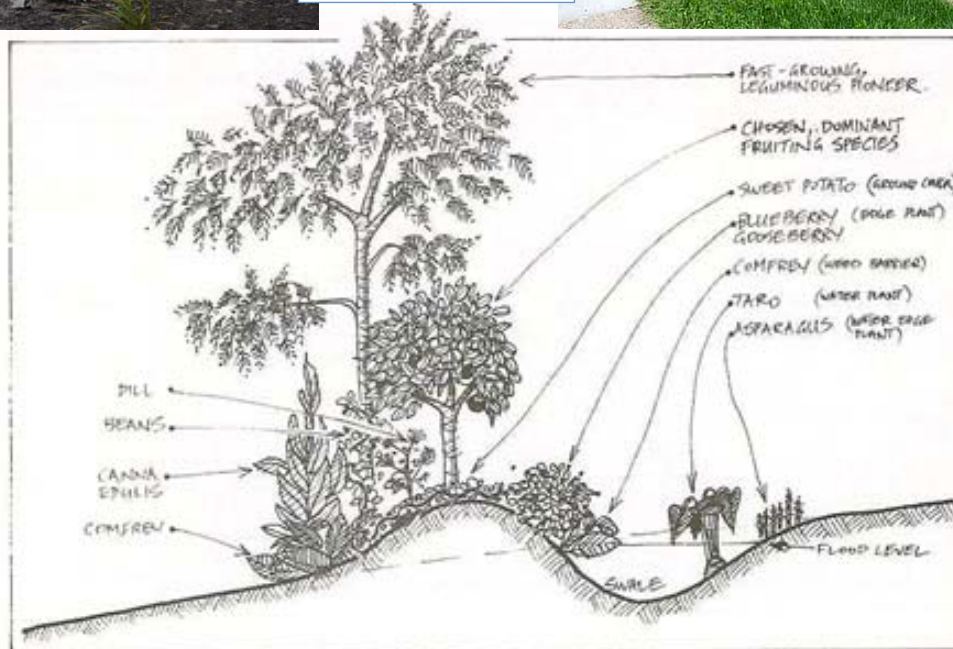
Rain Gardens. A rain garden is a shallow, constructed depression that is planted with deep-rooted native plants & grasses. It is located in the landscape to receive runoff from hard surfaces such as a roof, a sidewalk and a driveway. Rain gardens slow down the rush of water from these hard surfaces, holds the water for a short period of time and allows it to naturally infiltrate into the ground. Mimicking the natural absorption and pollutant removal abilities of a forest, meadow, or prairie - rain gardens can absorb runoff more efficiently - as much as 30 to 40 percent more efficiently than a standard lawn. By capturing rainwater in a rain garden, holding it and then slowly releasing it into the soil the rush of a large storm can be slowed and cleaned – quickly, neatly and naturally. Because rain gardens are 4 to 8 inches deep, and in some cases 1 to 2 feet deep, they hold larger quantities of rainwater making their overall construction more cost-efficient than other green alternatives. Rain gardens also require less technical experience for installation and can be installed without permits or



heavy equipment. Rain gardens are one very good option that helps to lower the impact of impervious surfaces and polluted runoff because they are low-tech, inexpensive, sustainable and esthetically beautiful. As part of this project, we will construct five rain gardens at two public sites.



*One study pegged rain gardens as a way to cut 30 percent of the pollution that reaches rivers.*



Pervious Pavement. Unlike traditional paving, pervious pavement allows water to soak in where it falls, mimicking the undeveloped condition. In addition to the benefits of reduced stormwater runoff, pervious parking lots are safer during a storm. Parking lots constructed of pervious pavement do not puddle; snow and ice melt more quickly and the rough texture is less slippery than conventional pavement. As the demand for pervious pavement grows, and the benefits are realized, the cost of this alternative (currently 20 to 50 percent more than conventional pavement) will decrease, and the technology will be even more attractive. We will install pervious concrete in highly visible parking areas, pathways and assembly locations at the Rood Center and YRCS. The public will learn about the benefits of the project site through interpretive panels, which will be installed in visible areas to further promote the use of pervious paving throughout the region.



**IRWMP Goals and Objectives.** This project has been integrated into the CABY IRWMP and is the only project in the Plan that directly addresses stormwater issues. This project addresses three of the CABY IRWMP's goals and six objectives, including:

- Goal 4: Protect infrastructure, equipment, and property from flooding
- Goal 5: Protect and improve watershed resources through land use practices
- Goal 8: Reduce contamination of surface and groundwater resources
- Objective 2: Implement measures to manage and reduce erosion and sedimentation
- Objective 9: Implement measures to manage and reduce contamination of waterways
- Objective 14: Optimize efficient use, conservation, and recycling of water resources
- Objective 18: Minimize impervious surface cover and improve infiltration
- Objective 19: Promote community and regional storm water management plans
- Objective 22: Evaluate and minimize negative flood impacts on water infrastructure and water quality

These IRWMP goals and objectives largely focus on reduction of sedimentation and contamination in the region's waterways, as well as managing projects to provide flood control and water supply benefits to downstream users. This project directly addresses the goals and objectives listed above, while also providing an opportunity to expand the discussion about upper watershed management activities that can positively impact flood risk in downstream areas.

**Project Status.** At the Nevada County Rood Center, Phase I of the project retrofitted an existing parking lot to capture and infiltrate two million gallons annually of stormwater runoff through two



rain gardens, one bio-swale, and pervious pavement. Interpretive signage was also installed. Construction of the initial phase was completed in 2010, and after a successful winter of runoff capture, our monitoring demonstrated significant water quality benefits. Phase I has thus become a proof-of-concept portion of the project demonstrating the value of additional green infrastructure work at this site and at YRCS. This initial phase also provides us a jump start on future phases as it helps streamline permitting and inspection of future construction related to this project as well as other stormwater installations in Nevada County for the following reasons: 1) Nevada County is now familiar with CEQA (a categorical exemption was determined for Phase I work) and construction permitting for green infrastructure stormwater projects, 2) the county has experience inspecting permeable concrete for ADA compliance, and 3) the county fully understands the benefits that such projects provide.

For Phase II, conceptual designs are complete for additional work at the Rood Center (30%) and the Yuba River Charter School (10%), and CEQA has been initiated and is expected by January 1, 2012.

**Existing Data and Studies.** Soil cores and groundwater levels have been analyzed at the Rood Center during Phase I, showing that the soil is composed of 20 feet of compacted fill. These are challenging conditions for on-site stormwater infiltration. However, with adequate soil amendment, we were able to construct infiltration features that functioned well through one of the wettest years on record. The YRCS site has much better drainage (percolation tests have been completed) and we expect less of a design challenge.

**Project Specifics.** This project is not part of the State Plan for Flood Control. It is a green infrastructure demonstration project that will be constructed at two public sites in the Yuba River Watershed and used to leverage other such beneficial activities throughout the Sierra. The project sites are described in detail below.

The Nevada County Rood Center is the most visited county building in Nevada City, a restored and charming gold mining town in the upper foothills of the Sierra. Surrounding the Rood Center is a 150,000 square foot parking lot ringed by majestic Ponderosa pines. When it rains, which often happens in the winter in the foothills, rainwater sheets across the parking lot picking up pollutants and fine sediment and then flows into the drain inlet. From here, the brown and polluted water rushes through a drainpipe, which is dumped into Deer Creek and the Yuba River. The Rood Center parking lot is not unique—this system of impervious pavement-curbs-culverts-drains is the predominant “grey infrastructure” that is used to manage stormwater across the country.

As described above, some stormwater management facilities have already been constructed as part of this project at the Rood Center, including two rain gardens, one bio-swale and interpretive signage. The initial phase retrofitted an existing parking lot to capture and infiltrate 2 million gallons annually. This project will expand those facilities to include a parking area demonstrating pervious concrete and an additional rain garden. The total project will capture and infiltrate 3.7 million gallons of parking lot runoff annually. It will also be an important demonstration project in a headwaters region where very few developments are designed to capture and treat stormwater on site. This portion of the project is prominently located in front of Nevada County’s two busiest facilities: the building department, administrative facility and the county library.

The Yuba River Charter School (YRCS) is the second site where stormwater management facilities will be constructed. The YRCS was founded in 1994 and currently serves 280 students (K - 8) and 30 staff members. The school has outgrown its current location and begun construction of a new campus on approximately 13 acres off of Rough and Ready Highway in Grass Valley, CA (also located in Nevada County, about 6 miles from the Rood Center). YRCS is the first Waldorf-inspired school to be built with public funds, and thus will be a prominent demonstration site for future charter schools. In addition to the green infrastructure stormwater elements proposed here, the new campus will incorporate passive solar heating and cooling, abundant natural light and ventilation, and shade tree and prevailing wind cooling. The site consists of Assessor's Parcel # 07-200-07 Zoned Commercial/Industrial and 07-230-14 Zoned Residential/Agricultural. Land use on the surrounding parcels is mixed. If stormwater management facilities are not constructed on site, runoff will flow through Grass Valley, picking up pollutants on its course to Deer Creek and the Yuba River.

**Project Timing and Phasing.** This project has been designed to proceed in two phases. Phase I (completed in 2010) constructed demonstration stormwater features, including rain gardens, a vegetated swale, and pervious concrete pathway at the Rood Center and library in Nevada City. These features now capture and treat 2 million gallons of runoff annually. This proposal focuses on Phase 2, which will increase stormwater capture at the Rood Center and construct a new stormwater demonstration project at the YRCS. The facilities at the Rood Center are fully standalone project elements and do not rely on subsequent projects for implementation. The stormwater facilities at the YRCS will be installed in conjunction with construction of the campus as a whole and will be fully functional without implementation of subsequent projects.

### **Project Tasks**

#### ***BUDGET CATEGORY (A): DIRECT PROJECT ADMINISTRATION COSTS***

##### **Task 1: Administration**

The project team recognizes that administration and management is a critical aspect of a successful project. Under this task, American Rivers will take the lead in fiscal management, finalizing the workplan, developing and managing subcontracts, convening project team meetings, developing and disseminating project information, finalizing outputs and outcomes and reporting performance. As part of this task, we will draft and finalize detailed MOU's with all project partners. These MOUs will clearly describe who will be responsible for all elements of the projects from design to implementation to upkeep over time.

Deliverables: Final workplan, signed subcontracts, monthly invoices, MOUs, and other deliverables, as required by the grant agreement.

##### **Task 2: Labor Compliance Program**

American Rivers is committed to fair labor practices and as a result has developed a durable relationship with a labor compliance administrator, 3QC.

A preliminary contract has been reviewed and prepared, ready for signature should this project be approved for funding. The duties that have been identified in the contract materials include but are not limited to: conduct a labor compliance workshop with the prime and sub-contractors; provide all necessary forms so each contractor is meeting the state labor law requirements; monitor and



maintain certified payroll and supporting documents for each contractor; ensure that the apprentice ratio is met, all apprentices are registered and paid the correct rates; ensure contractors are paying their workers travel and subsistence, when applicable; conduct random onsite interviews with the workers to cross reference with the certified payroll and ensure the workers are classified correctly and being paid the prevailing wage; file a written report and audit to the Labor Commissioner and request a forfeiture of payments if willful violation has occurred and the contractor will not correct the issue 3QC will then continue the violations process and enforcement procedures.

Deliverable: Submission of Labor Compliance Program

### **Task 3: Reporting**

The activities involved in this task will include preparation of quarterly reports, monthly invoices and associated status reports, and submittal of the final report. These activities will include: tracking of the specific status of each project task, documentation of task status in an easy-to-understand and track format, creation of quarterly financial reports for the project (including percent complete of project activities), and preparation of all necessary reports (including the final report) per the format stipulated in the DWR grant agreement.

Deliverables: Submission of quarterly, annual and final reports as specified in the grant agreement.

### ***BUDGET CATEGORY (B): LAND PURCHASE/EASEMENT***

N/A

### ***BUDGET CATEGORY (C): PLANNING/DESIGN/ENGINEERING/ENVIRONMENTAL DOCUMENTATION***

### **Task 4: Assessment and Evaluation**

Quantifying project benefits is a critical component of compelling demonstration projects. This task will quantify stormwater capture and water-quality impacts at the two project sites and in the receiving waters. The South Yuba River Citizens League (SYRCL) and American Rivers will play the lead role in designing and implementing the water quality benefits to these demonstration projects including collecting, analyzing and reporting on the data. This task will build on the extensive citizen water-quality monitoring program that SYRCL has already implemented in the Yuba Watershed. SYRCL will also work with teachers at the YRCS to integrate the water quality monitoring of the green infrastructure features into their curriculum to ensure a long-term database.

An additional goal of this task is to ensure that all data gathered and developed as a result of the project is made available to state databases as well as CABY members and the interested public using data management and monitoring deliverables that are consistent with the IRWM Plan Standards and Guidance (as stipulated in the August 2010 IRWM Guidelines, page 20). In this case, the appropriate approach is identified in the CABY Planning Grant submittal which will direct the IRWMP data collection efforts, regardless of whether the planning grant is funded or not. Data will be made available to all CABY members and the general public through the existing CABY SWIM Database. Material will be uploaded as it becomes available, however most of the data will be posted upon completion of the primary project activities. The CABY technical committee will evaluate project-related data to determine its appropriateness for upload to relevant state databases.

Deliverables: Monitoring plan, including performance measures, QAPP, final project monitoring report quantifying volume of water infiltrated, reduced pollutant loading, recommendations for adaptive management and next steps.

**Task 5: Design**

The goal of this task is to bring the project design to 100 percent (i.e., final) status. The project is not technically complex, but the facilities require careful technical, and in some cases, engineering specifications. This task will focus on taking our conceptual designs and creating final technical designs that will provide the basis for project implementation. American Rivers will work with Nevada County, the Yuba River Charter School, 450 Architects, Inc., and Integrated Environmental Restoration Services to finalize these designs. As part of this task, we will also solicit community input.

Deliverables: Completion of project plans and specifications at the 90 percent and final level.

**Task 6: Environmental Documentation**

The purpose of this task is to complete all necessary documentation for CEQA permitting. The construction activities for Phase I of the project, described above, were determined to be categorically exempt, because the improvements were located in areas previously disturbed and developed with parking areas or ornamental landscaped areas. It was further determined that the project would not adversely impact biological, cultural, geological, agricultural, aesthetic or hydrological resources.

This project involves the minor alteration of the public structure/facility at the Rood Center without expanding the facility and minor alterations to land that will not have an adverse environmental impact. The first phase constructed at the Rood Center was categorically exempt from CEQA. Because the additional work at the Rood Center and YRCS are similar in scope and extent to Phase I, these portions are also expected to be categorically exempt.

Deliverable: Approved and adopted CEQA documentation

**Task 7: Permitting**

The purpose of this task is to obtain the necessary permits for project construction activities. While extensive permits are not required, some necessary low-level permits will include a grading permit (for the infiltration trench) and encroachment permits (for the swale). This task will involve working with the appropriate county agency to obtain these permits. American Rivers will play the lead role in this task, with assistance from Nevada County.

Deliverables: grading permit and encroachment permit.

***BUDGET CATEGORY (D): CONSTRUCTION/IMPLEMENTATION*****Task 8: Construction Contracting**

Construction contractors were identified and contacted during the construction of Phase I of the project, and site-specific contracts have been developed. Contracting for the proposed project will



include: distributing a request for proposals, pre-bid meeting on site, proposal review, contractor selection, and contracting. American Rivers has worked extensively with Nevada County, the permitting authority for these projects, and a contributing partner at the Rood Center. American Rivers will lead this task with YRCS and Nevada County providing input on proposal review and contractor selection.

Deliverables: Advertisement for bids, pre-bid contractors meeting, evaluation of bids, award contract

### **Task 9: Construction**

The goal of this task is to install innovative green infrastructure stormwater management facilities at two sites. The facilities include: a rainwater-harvesting system, rain gardens, vegetated swales to capture and treat stormwater, and pervious concrete parking areas and pathways. Construction activities will use Best Management Practices (BMPs) and established standards and specifications for green infrastructure facilities. The community will also have an opportunity to provide input and support. For the YRCS site, which is a public school, all necessary agencies will review project plans before construction. Review agencies include Division of State Architects, Nevada County, California Department of Education, Office of Public School Construction, Department of Toxic Substances Control, and the School Facility Authority.

The specific activities involved in the construction task are described in detail below. The current conceptual plans and specifications are also included below.

#### Subtask 9.1 Mobilization and Site Preparation

This task will focus on preparing both project sites for construction activities and all related mobilization. A staging area will already be in place at the YRCS site, but will need to be created at the Rood Center. The staging areas will provide space where all equipment will be delivered and stored for the duration of construction activities. In addition to construction equipment (i.e., excavator, grader, and backhoe), the soil amendments (mixed compost and wood chips) will also be delivered to the site. The soil amendments will be used to increase the permeability of the site.

Deliverables: All necessary site preparation and equipment/contractor mobilization activities complete.

#### Subtask 9.2 Project Construction

This task will focus on constructing and installing all components of the stormwater management facilities at both the Rood Center and YRCS. Construction at both sites will begin with rough grading and creation of depressions for the rain gardens, retention basins, and swales. Two linear swales and two retention basins will be constructed at YRCS (none at the Rood Center). Rain gardens will be constructed at both sites. Soil amendments (mixed compost and wood chips) will be incorporated to increase the permeability of the swales and rain garden. Irrigation systems will be installed in the swales and rain gardens to ensure success of the vegetation during the establishment period and dry season. Native plants and seedlings will include grasses, wildflowers, trees, and shrubs.

Pervious pavement will be installed at both sites. At the Rood Center, pervious paved area will include a parking lot and walkway. At the YRCS, pervious pavement will be installed on

the access road, parking area and throughout the campus (walkways and entranceways connecting classrooms and other buildings, and outdoor assembly areas). Installation of pervious pavement at both sites will involve initial grading and installation of porous sub-grade. Once the sub-grade has been compacted to create a uniform and stable surface, forms will be put in place and pervious concrete mix will be poured. Proper curing is essential to the structural integrity of a pervious concrete pavement. Curing ensures sufficient hydration of the cement paste to provide the necessary strength in the pavement section to prevent break down. The pervious concrete will be covered with plastic sheeting for one week during the cure process.

Curb cuts will also be installed in the parking areas at both the Rood Center and YRCS to ensure that any runoff is captured and directed into the other stormwater management facilities, such as rain gardens.

Deliverables: Photographs during and after construction; completed projects accepted by property owners (i.e., YRCS and Nevada County)

#### Subtask 9.3 Performance Testing and Demobilization

The goal of this task is to ensure that constructed facilities are working properly and directly stormwater runoff flow patterns as expected. The contractor, the County, and YRCS will conduct performance testing, such as testing irrigation system to ensure function. If stormwater runoff is not flowing as expected to rain gardens and/or swales, then this will be remedied by shifting feature placement. The performance testing will also include an inspection of any erosion or standing water that is found on-site to ensure that planting, mulching, and other features were successfully installed. This task will also involve general site clean up and removal of equipment and BMPs, such as straw wattles and fencing.

Deliverables: Performance testing, stormwater facilities functioning properly, equipment and BMPs removed.

### **Task 10: Outreach and Education**

Green infrastructure provides an excellent opportunity to develop community awareness and understanding around the importance of sustainable water resource management, including stormwater management. Thus, outreach and education are critical components of this demonstration project. Project partners are well versed in turning scientific data into useable information. Outreach for this project will be based on the data collected in Task 4 above, and will be conducted by American Rivers with assistance from CABY. Outreach will be focused on Sierra communities and IRWMP regions that have stormwater issues and will include developing and implementing an outreach and education strategy that will likely integrate both active outreach (such as Stormwater Demonstration Days), as well as design and implementation of interpretative features at each of the demonstration sites (such as signs and brochures). Presentations will also be created and delivered to stakeholder groups and IRWMPs and posted on the American Rivers and CABY websites.

Deliverables: Interpretive features (signs and brochures), PowerPoint presentation, website postings and press releases

**BUDGET CATEGORY (E): ENVIRONMENTAL COMPLIANCE/MITIGATION/ ENHANCEMENT**

**Task 11: Environmental Compliance/Mitigation/Enhancement**

CEQA has already been completed for Phase I of this project and resulted in a categorical exemption determination. CEQA has been initiated for Phase II (the project components in this proposal) and is expected to be complete by January 1, 2012. Should any compliance or mitigation factors be identified, they will be followed all necessary reporting or tracking of compliance will be completed.

Deliverables: Compliance with all CEQA mitigation factors, if any are identified.

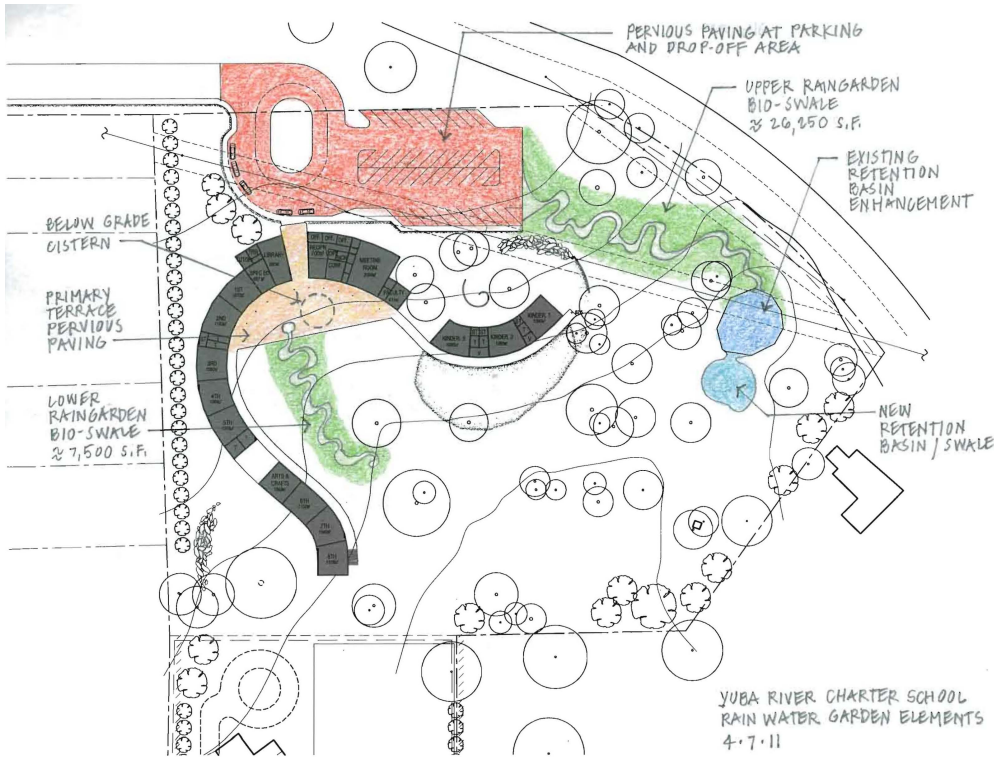
***BUDGET CATEGORY (F): CONSTRUCTION ADMINISTRATION*****Task 12: Construction Administration**

YRCS will take the lead on this task. Supervision activities will include: on-site observations and inspections, inspection of materials prior to installation, conducting construction progress meetings as required, review of project status (percent complete versus percent spent), inspection of work through all phases of construction, preparation and processing of change orders, review and approval of progress payments and recommendations for payment (as required), in-field problem solving during construction in response to unexpected field or system conditions, etc.

Deliverables: Supervision of all project construction activities, completion of final report.



Figure 3.1: Yuba River Charter School Site Plan

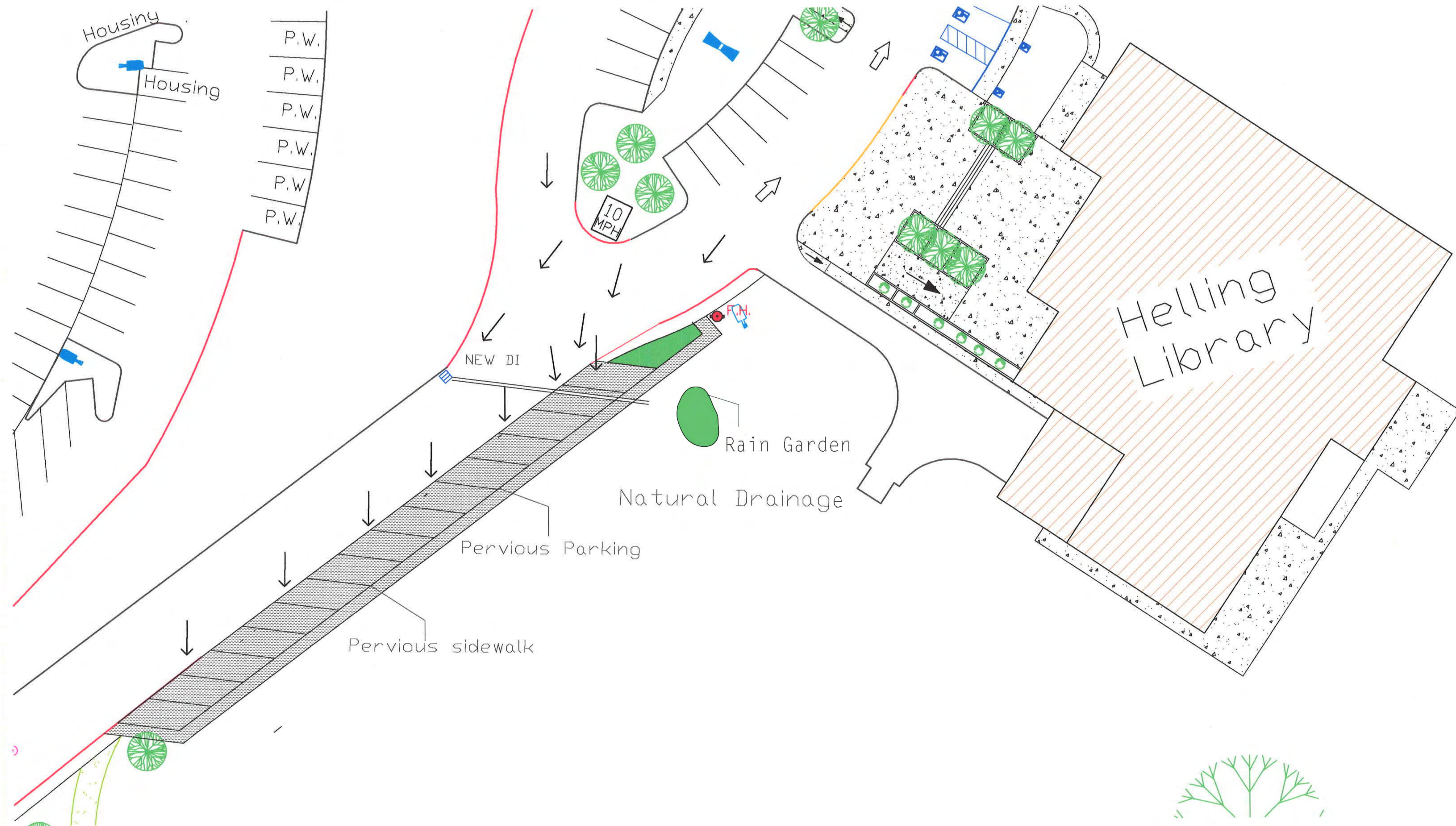


### YRCS Project Site Elements

Access roads and parking:	34,000 SF permeable pavement
Walkways and Assembly area:	6,800 SF permeable pavement
Bio-swales and rain gardens:	33,750 SF
Retention basins (2):	3,000 SF

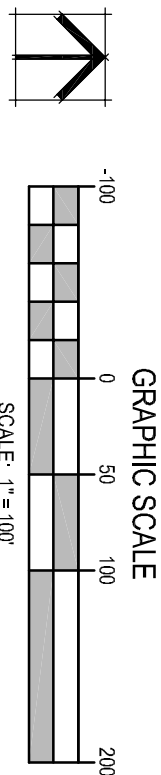


Figure 3.2: Rood Center Site Plan





AMERICAN RIVERS  
NEVADA COUNTY ROOD CENTER  
950 MAIDU AVENUE NEVADA CITY, CALIFORNIA 95959



EXISTING SITE OVERVIEW

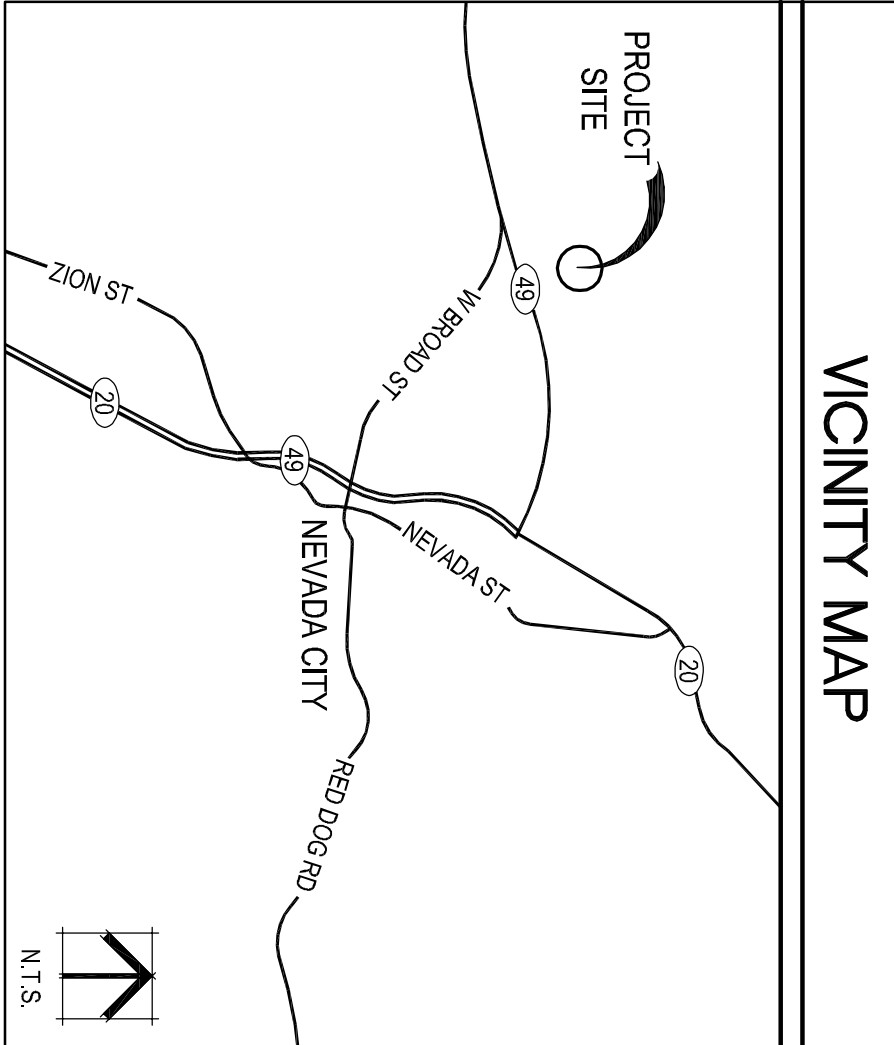
SHEET INDEX

- T1.0 - TITLE SHEET
- N1.0 - CONSTRUCTION NOTES & SPECIFICATIONS
- C1.0 - EXISTING OVERALL SITE PLAN WITH AERIAL PHOTO
- C2.0 - EXISTING / DEMO SITE PLAN RAIN GARDEN
- C2.1 - PROPOSED IMPROVEMENTS RAIN GARDEN
- C3.0 - EXISTING / DEMO SITE PLAN BIO SWALE
- C3.1 - PROPOSED IMPROVEMENTS BIO SWALE
- C3.2 - BIO SWALE PLAN & PROFILE
- CD1.0 - CONSTRUCTION DETAILS
- CD1.1 - CONSTRUCTION DETAILS
- L1 - PLANTING PLAN RAIN GARDEN
- L2 - PLANTING PLAN BIO SWALE
- L3 - PLANTING DETAILS
- I1 - IRRIGATION PLAN RAIN GARDEN
- I2 - IRRIGATION PLAN BIO SWALE
- I3 - IRRIGATION DETAILS

RECORD DRAWING NOTE

ALL INFORMATION SHOWN ON THESE PLANS HAS BEEN PREPARED BY OR UNDER DIRECTION OF THE UNDERSIGNED ENGINEER. ADJUSTMENTS MADE IN THE FIELD DURING CONSTRUCTION ARE INCLUDED HEREIN AND ARE BASED UPON FIELD OBSERVATIONS MADE UNDER THE DIRECTION OF OR BY THE UNDERSIGNED AND/OR INFORMATION RECEIVED FROM THE PROJECT OWNER, PROJECT CONTRACTORS, AND PUBLIC AGENCIES WHEN THE ENGINEER IS ADVISED IN WRITING OF SUCH CHANGE. THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR OR LIABLE FOR CHANGES TO THESE PLANS NOT AUTHORIZED BY THE ENGINEER.

DATE	ENGINEER SIGNATURE (STAMP OR SEAL)
DATE	CONTRACTOR SIGNATURE



CONTACT INFORMATION

ENGINEER: P-R DESIGN & ENGINEERING INC.  
ATTN: ANDREW RYAN, P.E.  
P.O. BOX 1847  
8931 NORTH LAKE BLVD.  
KINGS BEACH, CA 96143  
(530) 546-4500

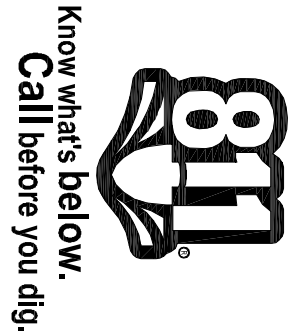
CONTRACTOR: INTEGRATED ENVIRONMENTAL  
RESTORATION SERVICES, INC.  
ATTN: KEVIN DRAKE  
P.O. BOX 7559  
2780 LAKE FOREST ROAD  
THAOE CITY, CA 96145  
(530) 581-4377

LANDSCAPE ARCHITECT: TALLAC APPLIED ECOLOGY & DESIGN  
ATTN: SHERYL DOWNUM  
602 REDWOOD WAY  
NEVADA CITY, CA 95959  
(530) 545-3718

CLIENT: AMERICAN RIVERS  
ELIZABETH SODERSTROM  
422 BROAD STREET  
NEVADA CITY, CA 95959  
(530) 285-5861



NOTICE:  
48 HOURS PRIOR TO ANY EXCAVATION CONTRACTOR IS TO CALL  
UTILITY SERVICE ALERT.  
PHONE # 1-800-227-2800  
ALL EXCAVATION AREAS TO BE CLEARLY MARKED IN WHITE PAINT.



CAUTION NOTICE  
THE HORIZONTAL/VERTICAL LOCATIONS OF EXISTING UTILITIES AND FEATURES (I.E. - BUILDINGS, STREETS, WALLS, WALLS, ETC.) SHOWN ON THESE PLANS ARE BASED ON THE BEST INFORMATION AVAILABLE PROVIDED TO THE ENGINEER. THE UTILITIES AND FEATURES SHOWN MAY NOT BE AN ACCURATE REPRESENTATION OF EXISTING CONDITIONS IN THE FIELD. THE CONTRACTOR SHALL VERIFY THE LOCATION OF UTILITIES AND FEATURES PRIOR TO CONSTRUCTION AND SHALL NOTIFY THE ENGINEER OF ANY CONFLICTS BETWEEN THE INFORMATION SHOWN ON THE PLANS AND EXISTING CONDITIONS IN THE FIELD. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT ALL CONFLICTING UTILITIES AND FEATURES ARE RELOCATED/RECONSTRUCTED AS NEEDED, WITH GOVERNING AGENCY APPROVAL, IN ORDER TO CONSTRUCT PROPOSED IMPROVEMENTS.



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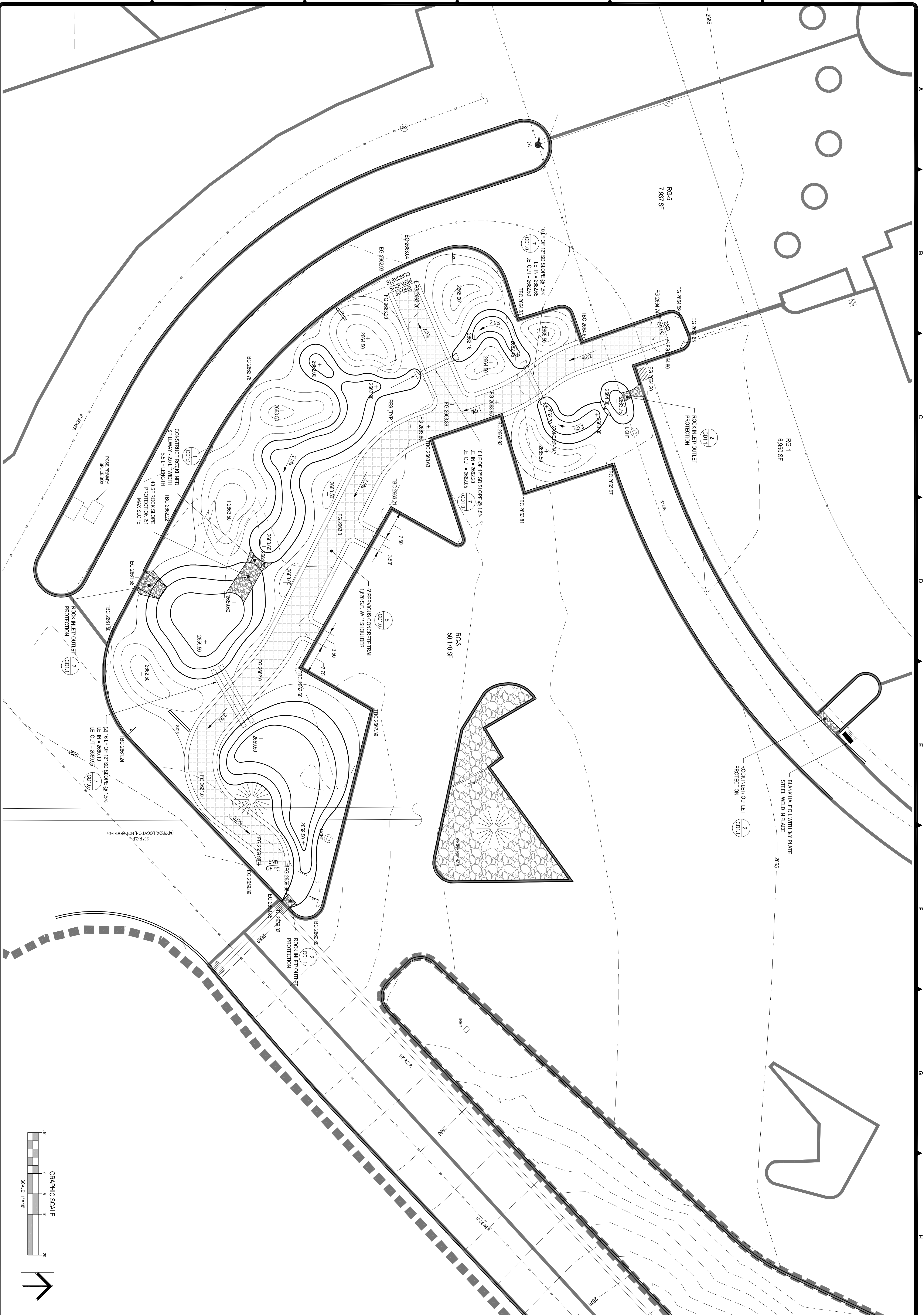
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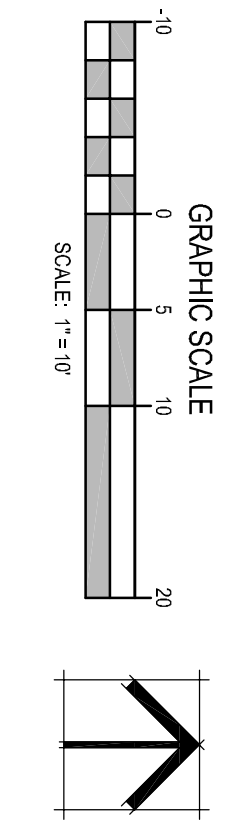
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**P-R DESIGN & ENGINEERING INC.**  
8931 North Lake Blvd, P.O. Box 1847  
King Beach, California 94145-1847  
Tel: 530-546-4500 Fax: 530-452-2074  
www.prdei.com

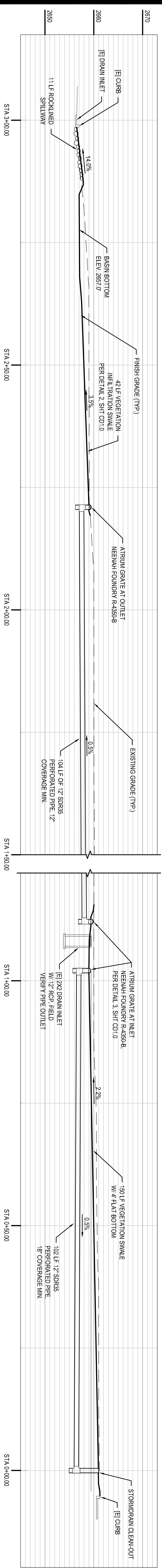
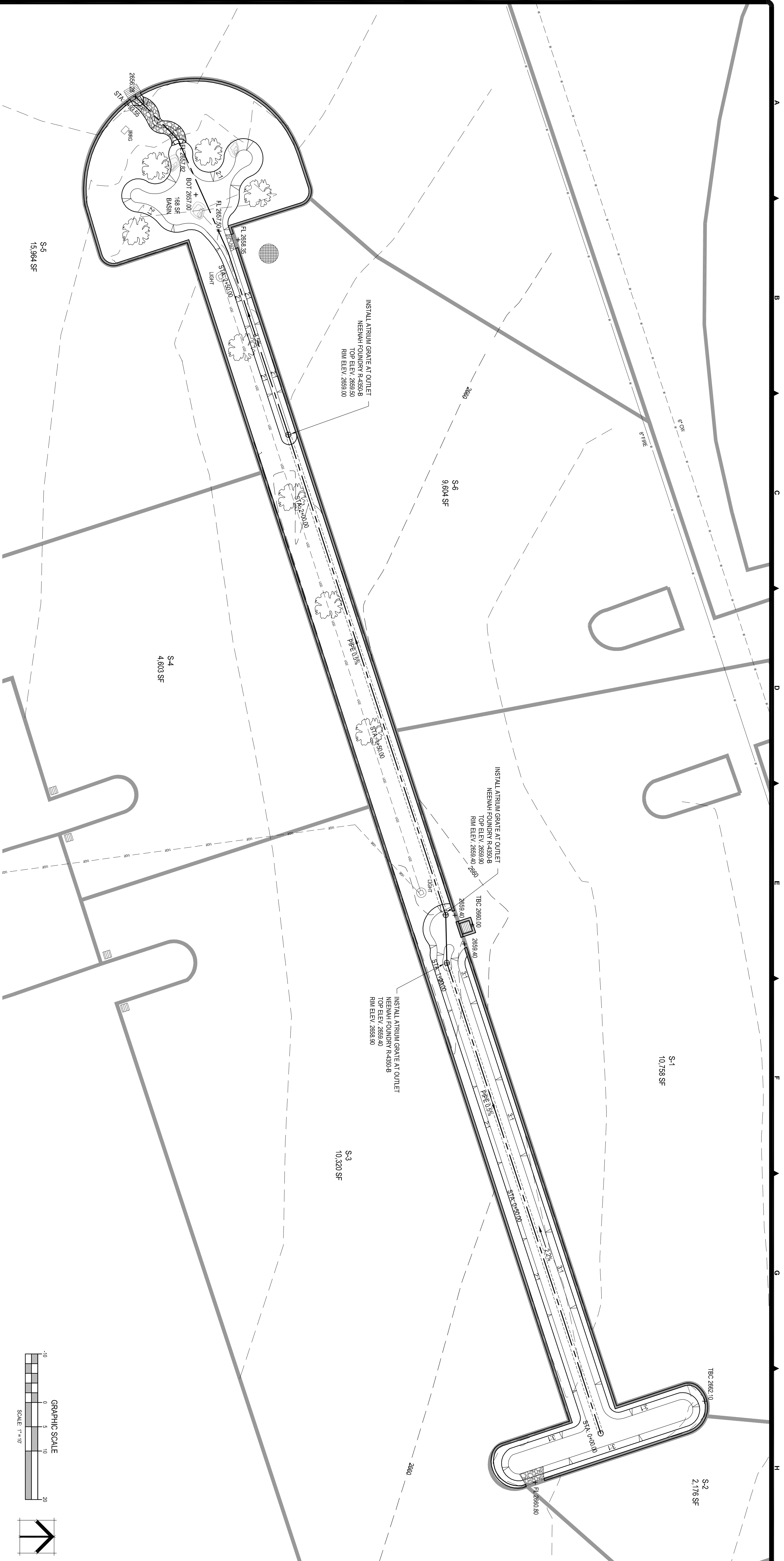


NEVADA COUNTY ROOD CENTER  
**PROPOSED IMPROVEMENTS: RAIN GARDEN**  
APN: 05-020-17  
NEVADA COUNTY  
950 MAIDU AVENUE  
NEVADA CITY, CALIFORNIA



C2.1

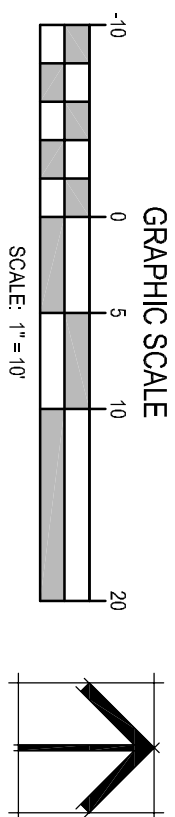




BIO SWALE PROFILE

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GRAPHIC SCALE  
SCALE: 1"=10'



NEVADA COUNTY ROOD CENTER  
BIO SWALE PLAN & PROFILE  
APN: 05-020-17  
NEVADA COUNTY  
950 MAIDU AVENUE  
NEVADA CITY, CALIFORNIA



P-R DESIGN & ENGINEERING INC.  
8951 North Lake Blvd, P.O. Box 1847  
King's Beach, California 94145-1847  
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www.prdei.com



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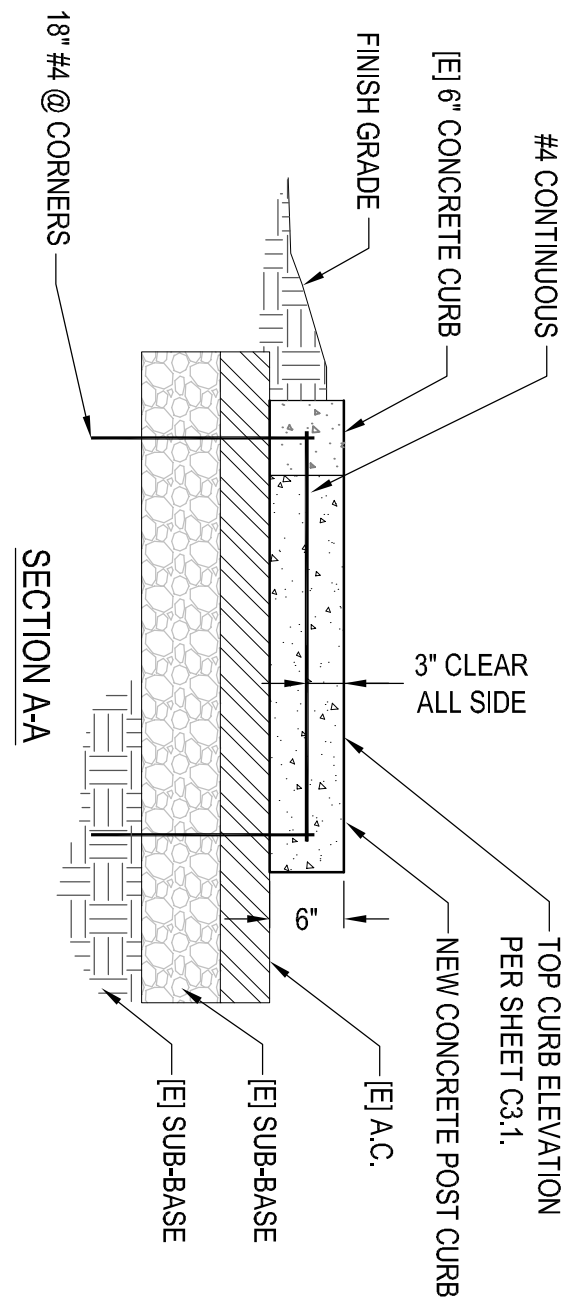




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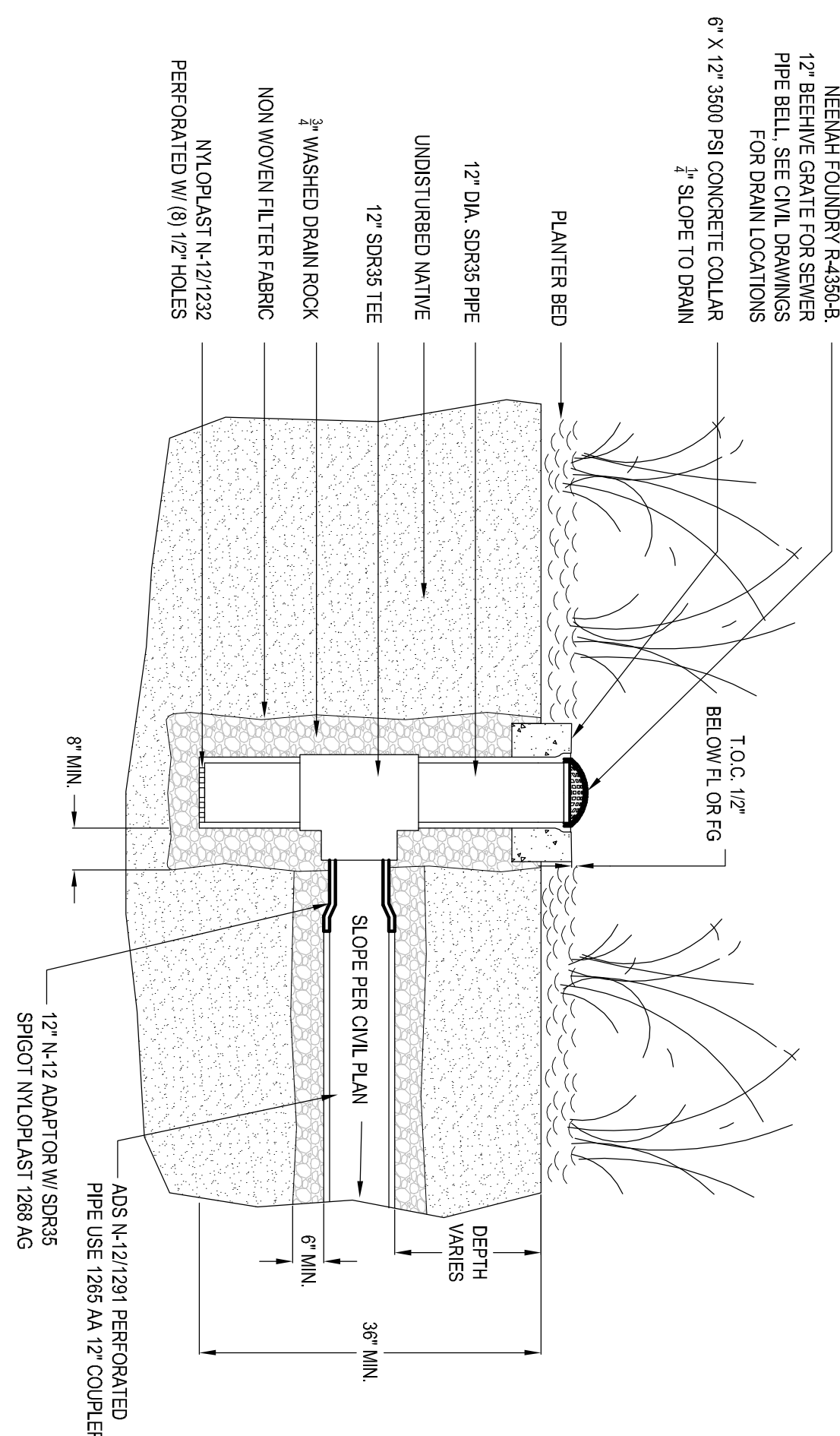
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ATRIUM GRATE INLET






NO SCALE 3



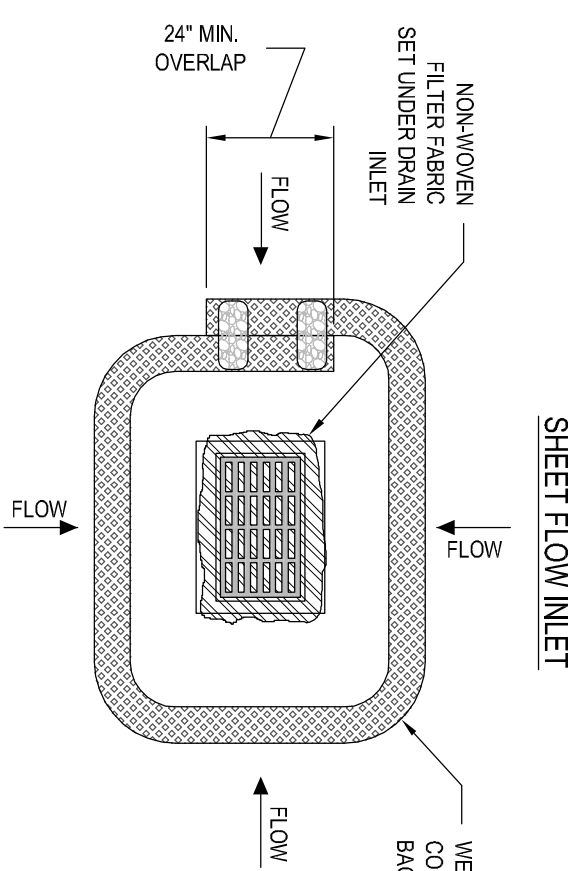
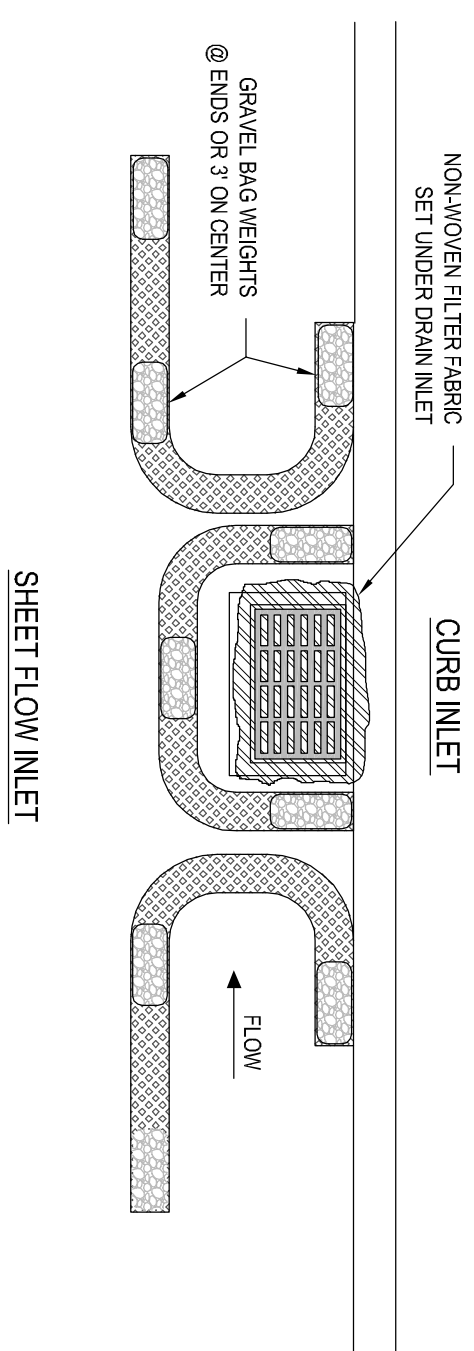
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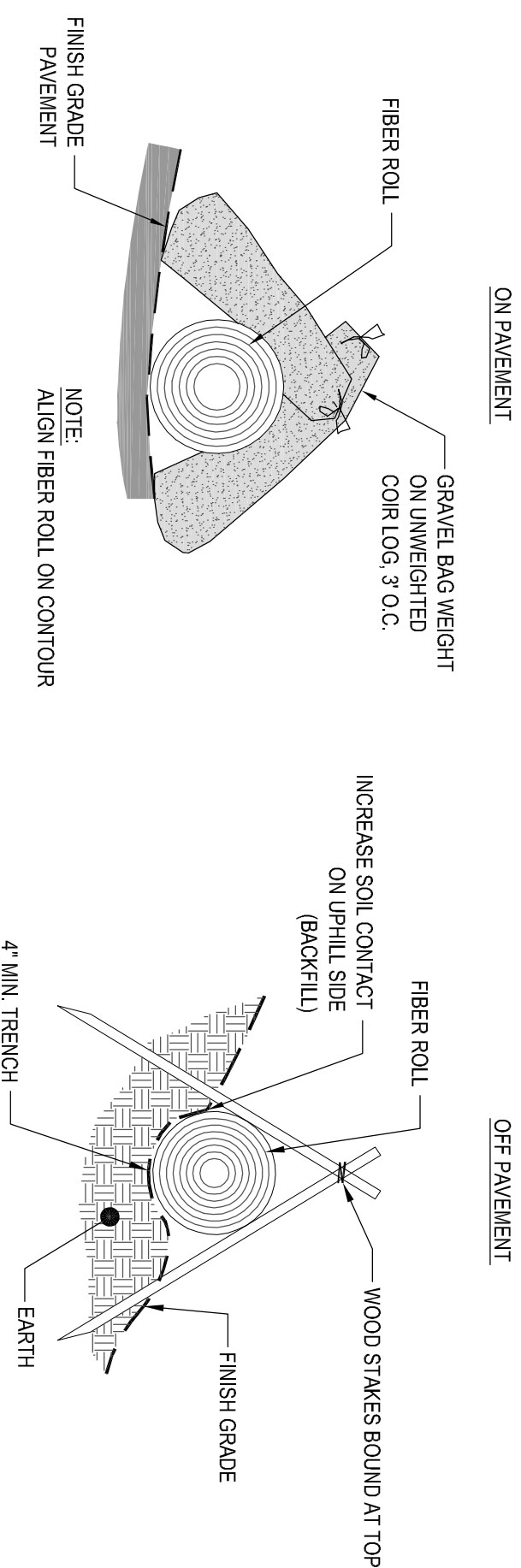




- NOTES
1. GRAVEL BAGS SHALL BE WOVEN GEOTEXTILE FABRIC.
  2. CONSTRUCTION ON EXISTING SLOPING STREET'S HIGHER WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE OUT OF SUSPENSION.
  3. INSPECT AND REPAIR CLOSURES AFTER EACH STORM EVENT. REMOVE SEDIMENT WHEN ONE HALF OF THE FILTER DEPTH HAS BEEN FILLED. REMOVED SEDIMENT SHALL BE DISPOSED OF PROPERLY.
  4. SEDIMENT AND GRAVEL SHALL BE IMMEDIATELY REMOVED FROM RAINFALL WAY OF ROAD.

## DRAIN INLET PROTECTION

NO SCALE | 7

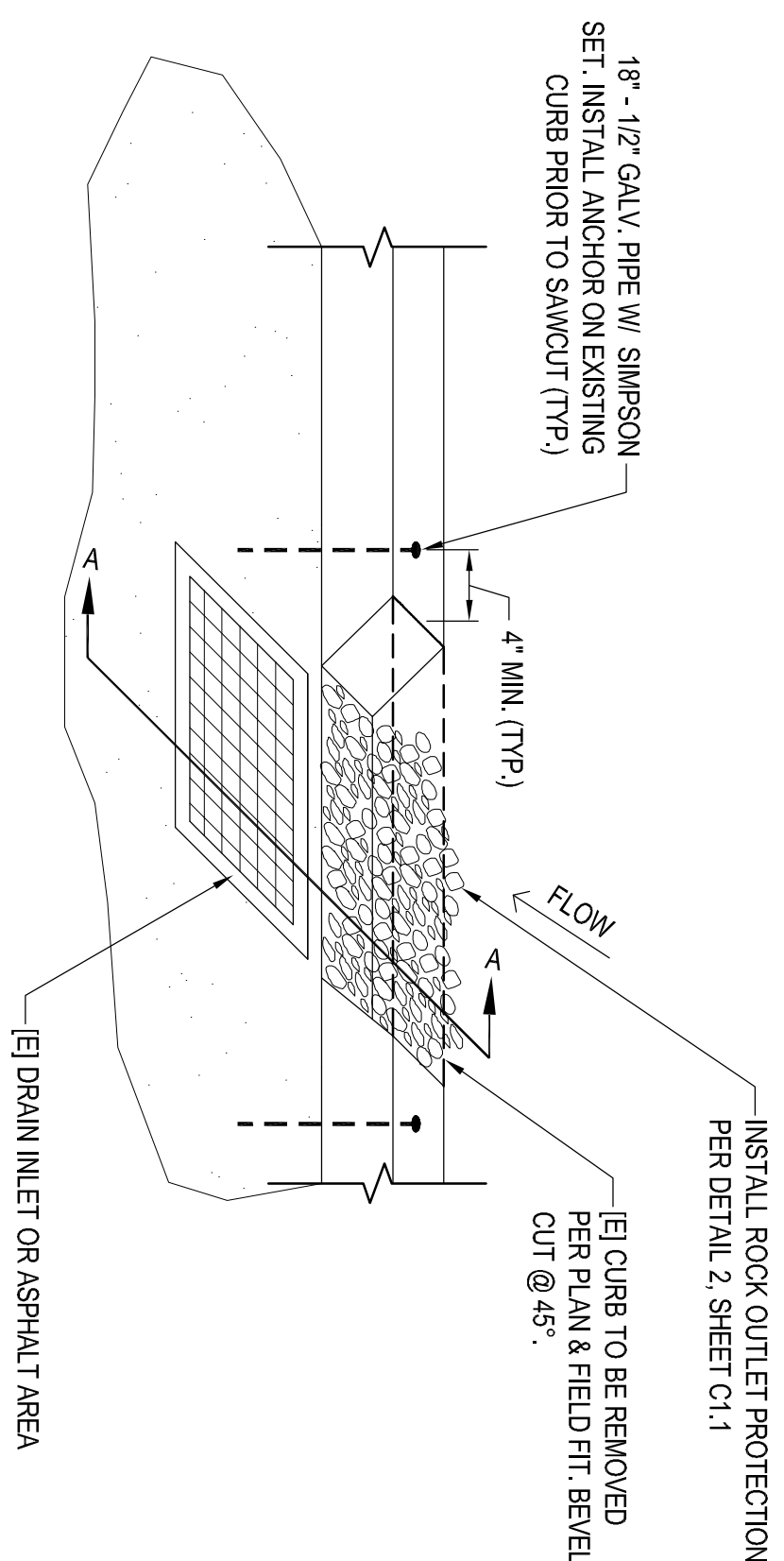
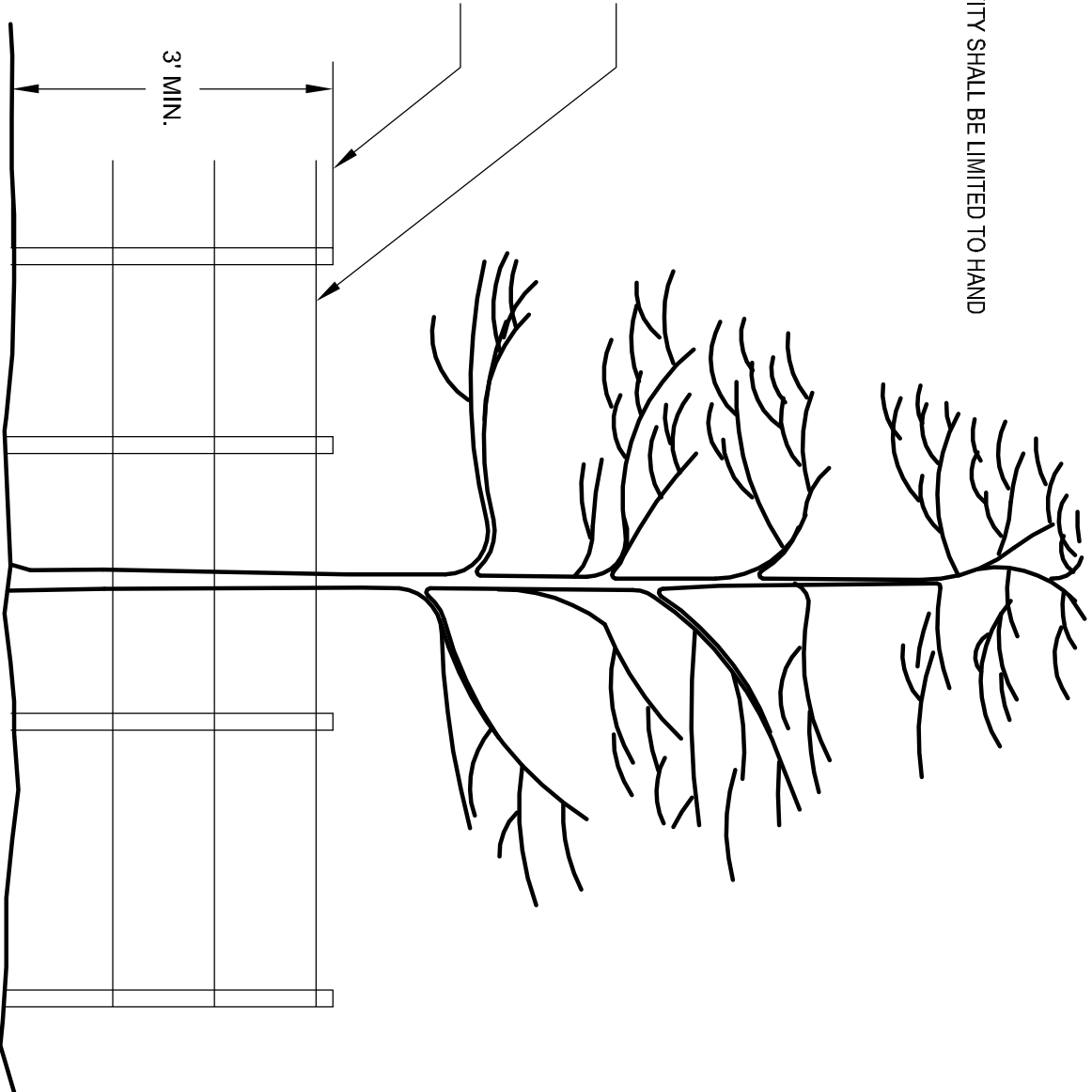


1. FIBER ROLLS MUST BE ENTRAPPEDED FOUR INCHES TO ENSURE MAXIMUM CONTACT SURFACE AREA WITH SOIL.
2. TURN THE ENDS OF THE FIBER ROLL UP SLIGHT TO PREVENT RINOFF FROM GOING AROUND THE ROLL.
3. ENSURE THAT THE FIBER ROLL MAKES GOOD CONTACT WITH THE SOIL AT ALL LOCATIONS THERE SHALL BE GAPS BETWEEN THE FIBER ROLL.
4. FIBER ROLLS MUST BE STAGED IN SUCH A MANNER THAT THEY ARE NOT DISTURBED BY WIND OR SHEET FLOW RINOFF.
5. IF MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED, NOT ADJUTED.
6. INSPECT AND MAINTAIN FIBER ROLLS DAILY AND AFTER EACH STORM EVENT.

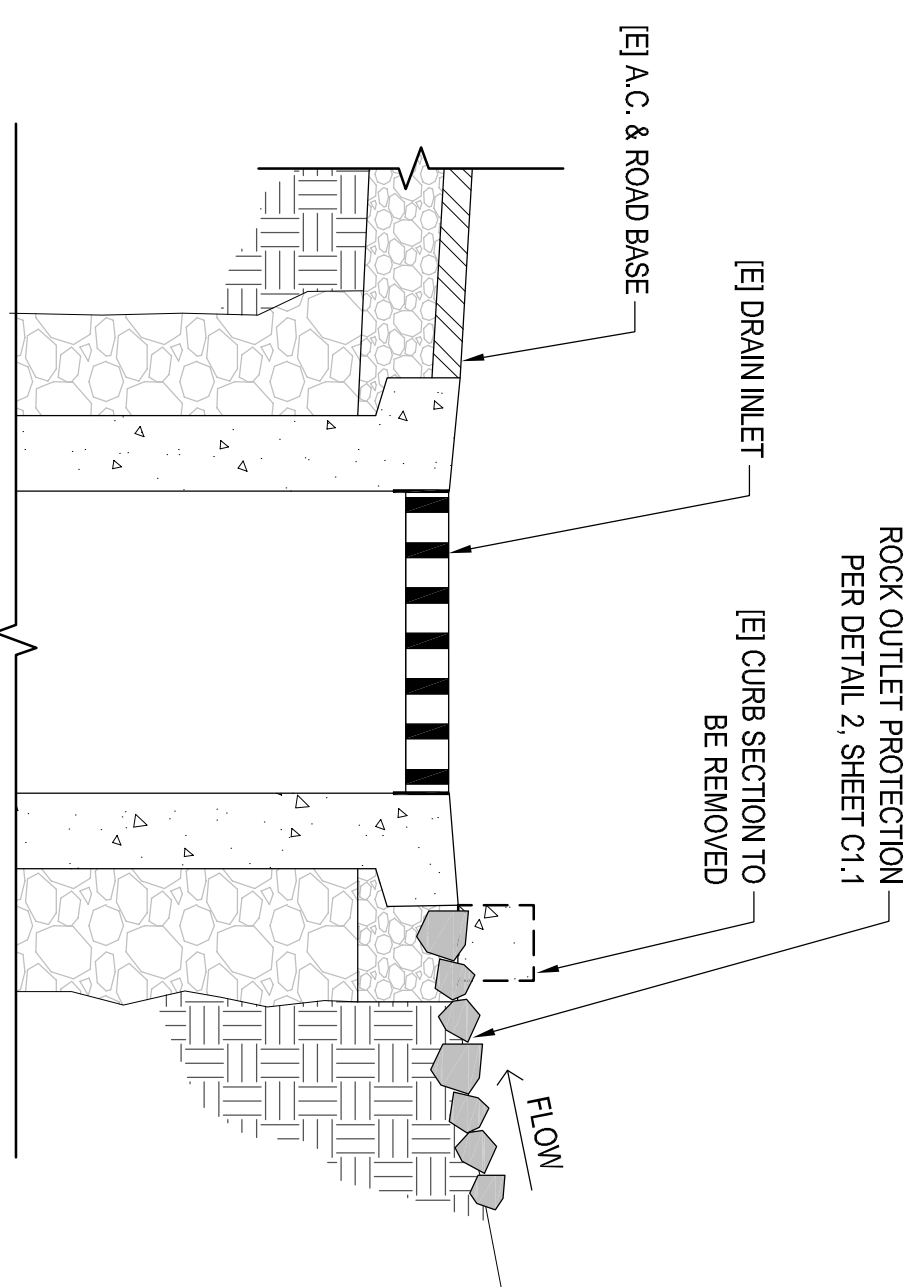
## WATTLE / FIBER ROLL

6 NO SCALE

NOTE:  
AFTER PLANTING, WORK ACTIVITY SHALL BE LIMITED TO HAND  
CREW MAINTENANCE ONLY.

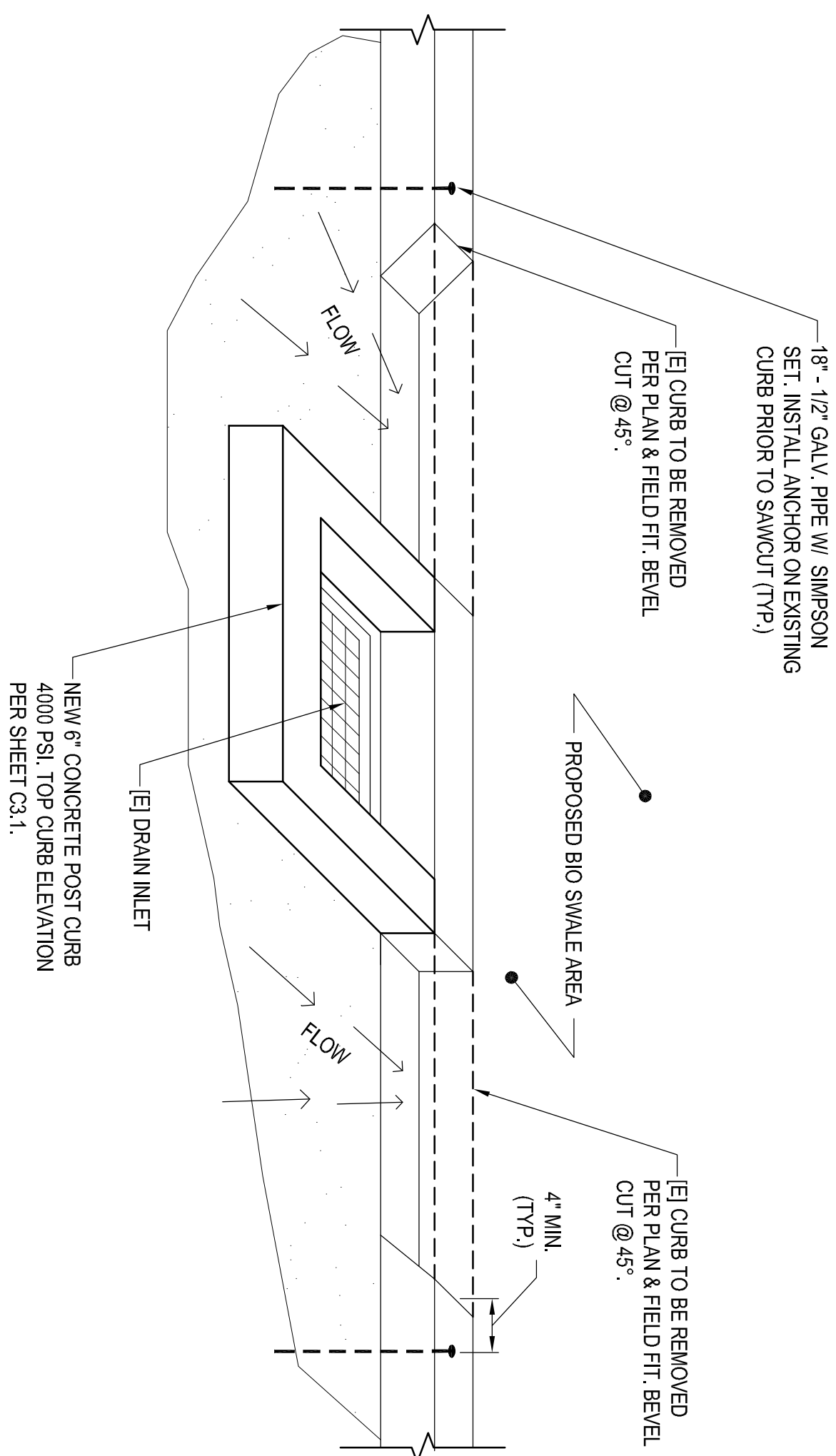


## SECTION A-A



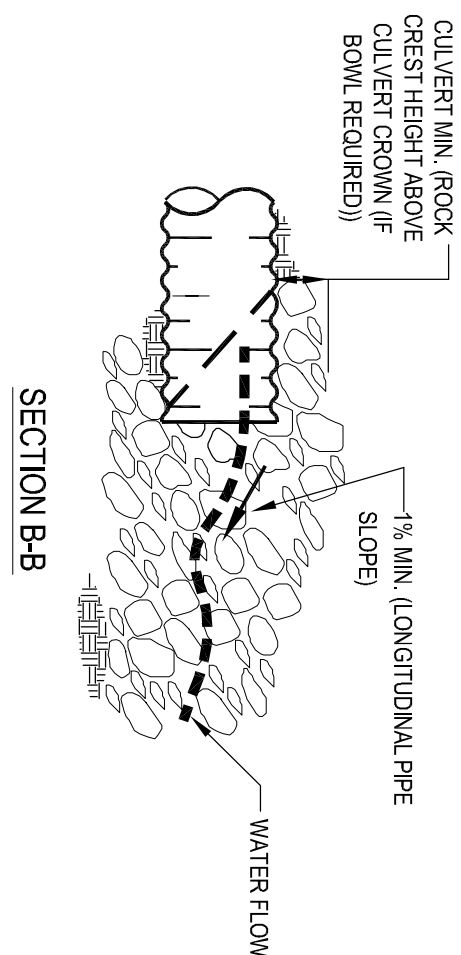
## OUTFLOW CURB CUT

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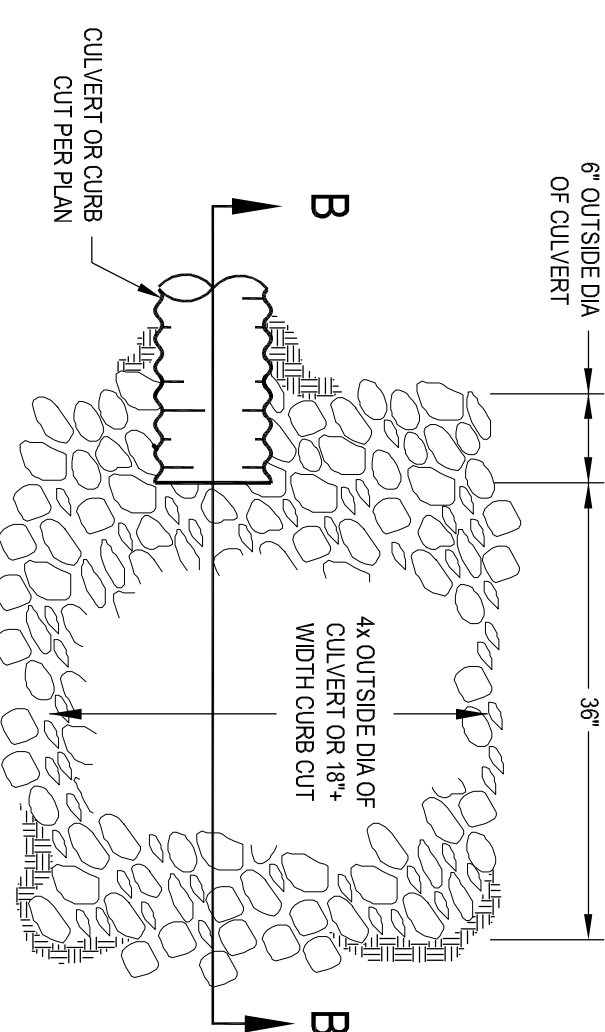


## BIO SWALE CURB CUT

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## SECTION B-B



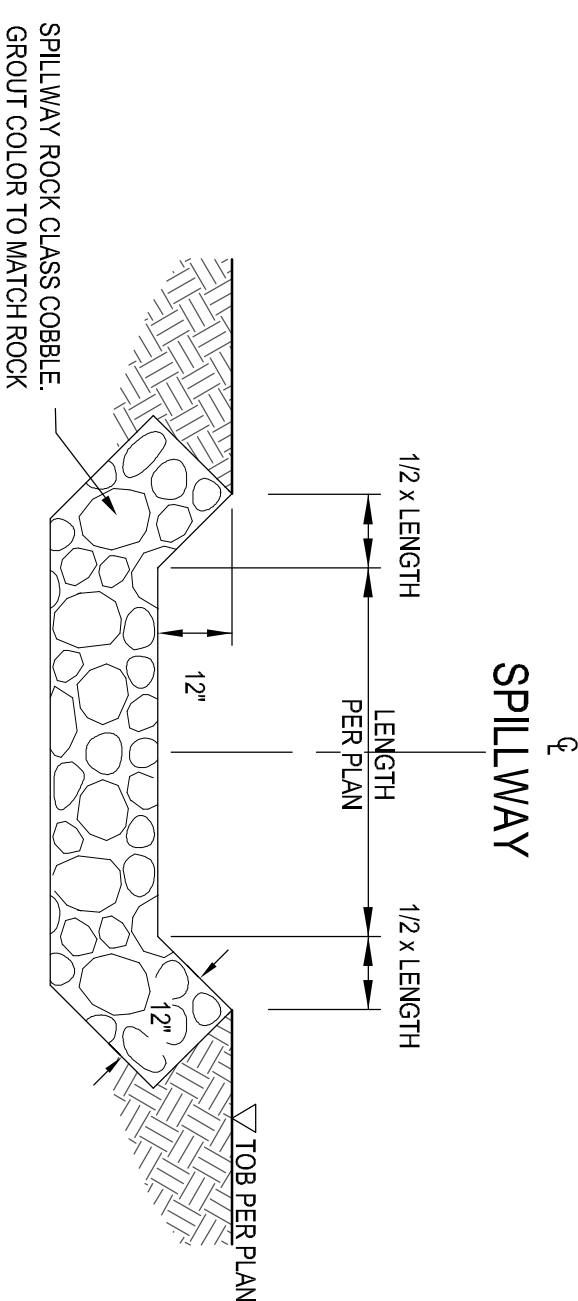
## OUTLET PROTECTION

## PLAN VIEW

- NOTES:
1. HAND PLACE ROCKS.
  2. ALL ROCKS SHALL BE ANGULAR AND HAVE TWO FACES.
  3. WHERE SLOPES OF CUTS EXCEED 3%, A SEDIMENT BOWL OR ENERGY DISSIPATER SHALL BE REQUIRED AT 1:1 MAX SLOPES.
  4. ROCK SLOPE PROTECTION SHALL BE SLOPED AT A MIN. OF 1% OUT OF CULVERT.
  5. ON OUTLET APPLICATIONS, 50% OF THE ROCKS SHALL BE LARGER THAN HALF THE DIAMETER OF THE PIPE.

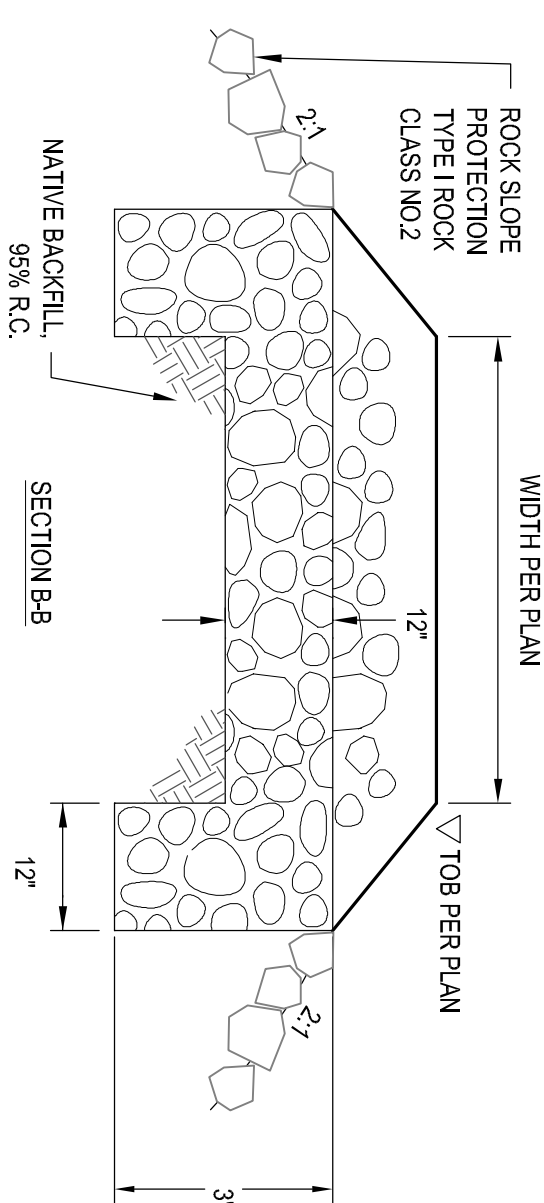
## ROCK INLET/OUTLET PROTECTION

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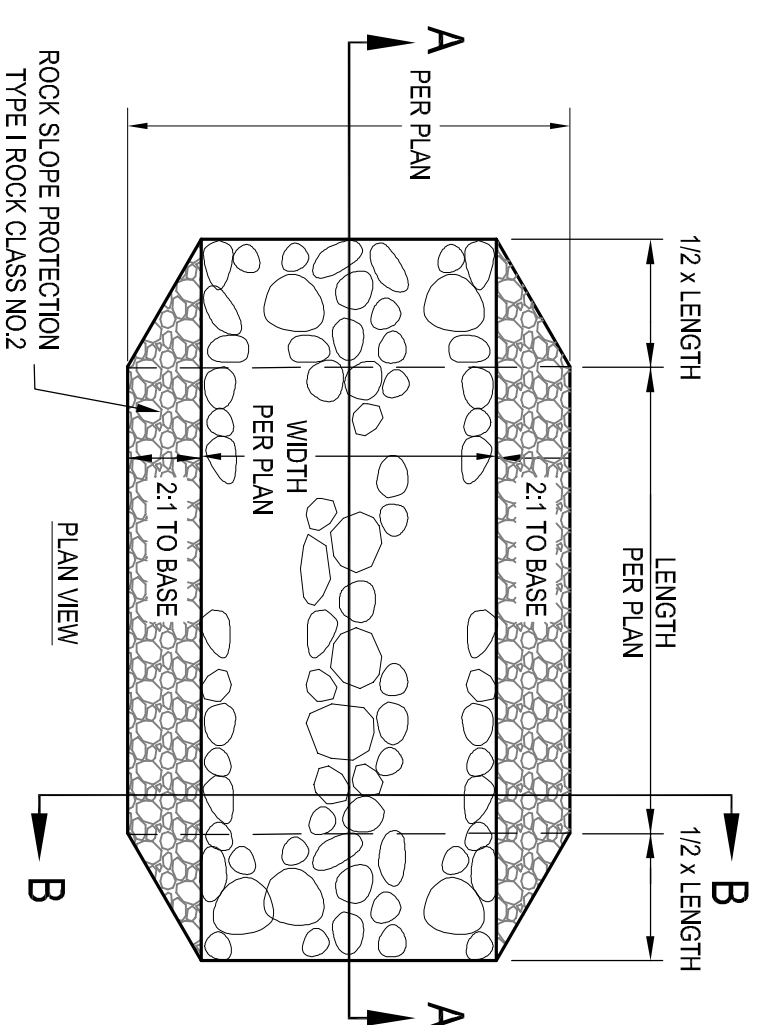


## —LWAY

## SECTION A-A



## SECTION B-

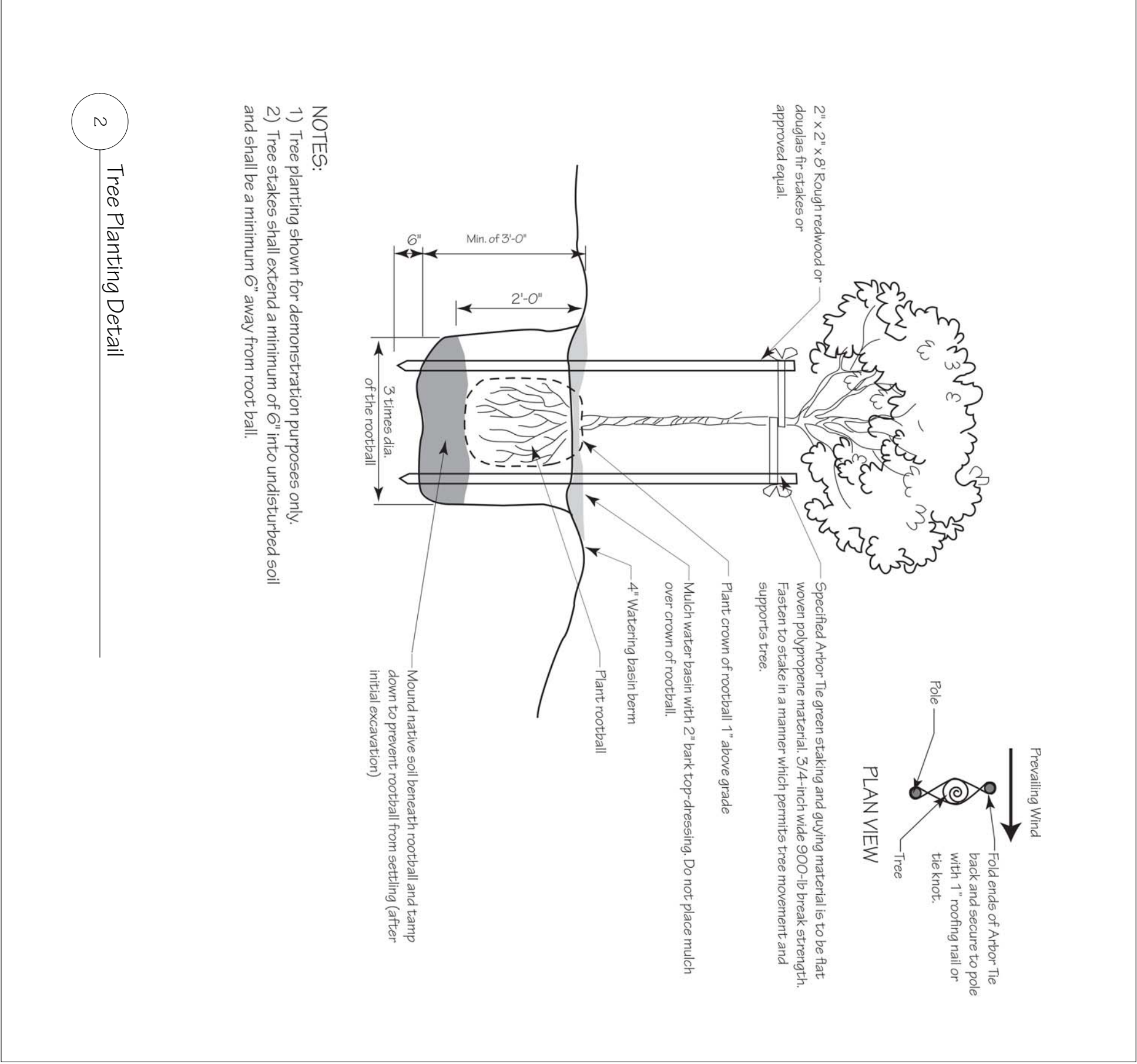
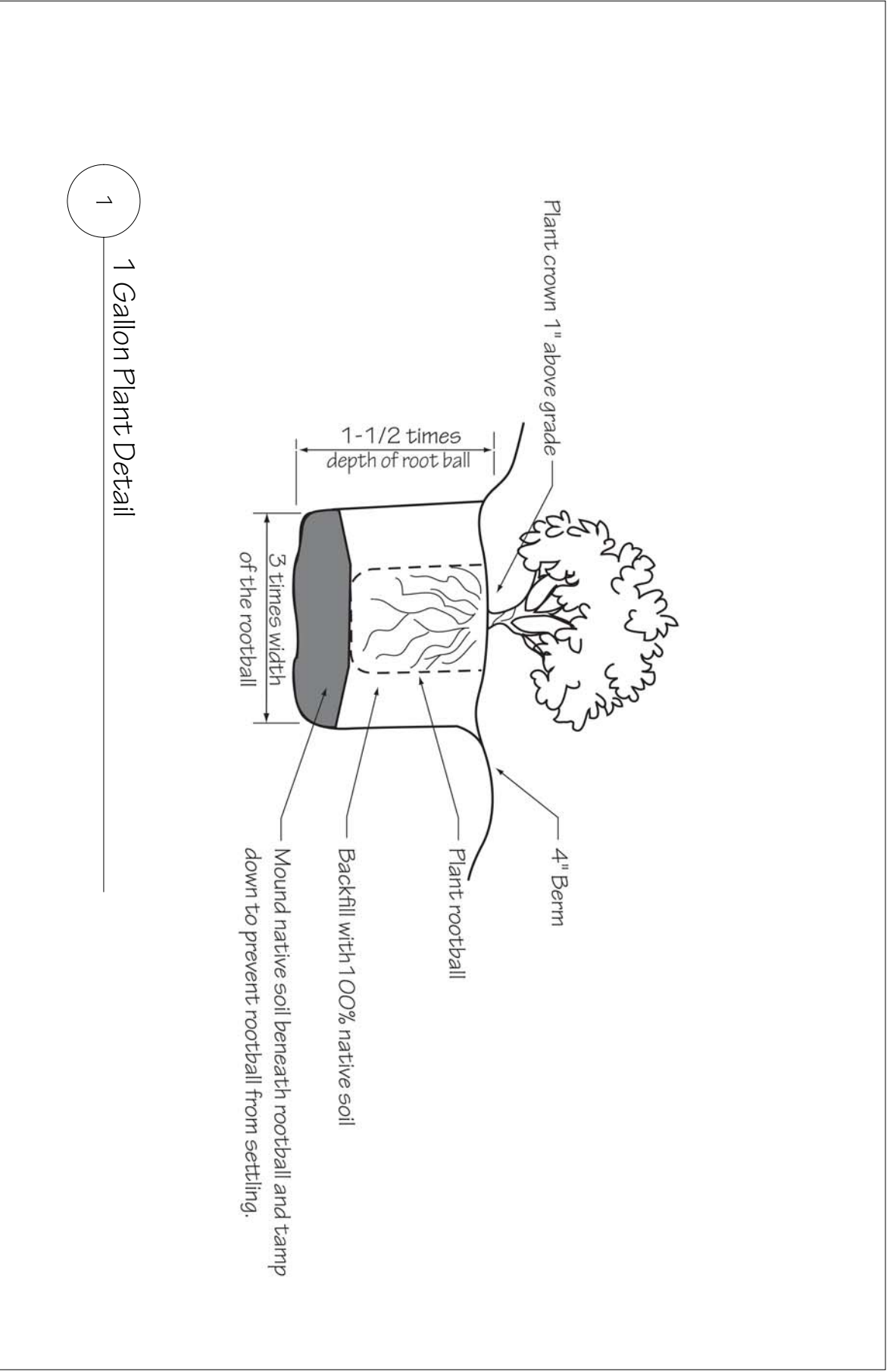


## SPILLWAY PLAN & SECTION

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### American Rivers LID Project Plant List

ID	Qty	Botanical Name	Common Name	Scheduled Size
AC	3	<i>Aesculus californica</i>	California buckeye	T8
AU	86	<i>Arctostaphylos uva-ursi</i> 'Green Supreme'	green supreme bearberry	1 gal
CO	14	<i>Cercis occidentalis</i>	western redbud	T4
EC	11	<i>Epiobium canum canum</i>	California fuschia	L8
HA	7	<i>Heteromeles arbutifolia</i>	toyon	T4
LA	25	<i>Lupinus albfrons</i>	bush lupine	L8
MA	19	<i>Mahonia repens</i>	creeping mahonia	1 gal
MR	32	<i>Muhlenbergia rigens</i>	deer grass	L8
PH	42	<i>Penstemon heterophyllus</i>	foothill penstemon	1 gal
PR	5	<i>Platanus racemosa</i>	western sycamore	T8
QK	15	<i>Quercus kelloggii</i>	California black oak	T8
RG	88	<i>Rosa gymnocarpa</i>	wood rose	1 gal
SAL	36	<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	creeping snowberry	1 gal
SD	30	<i>Spiraea douglasii</i>	western spiraea	1 gal

### Seed Mix:

Species	Rate (PLS/ac)
<i>Vulpia microstachys</i>	10
<i>Festuca rubra</i>	12
<i>Hordeum brachyantherum californicum</i>	7
<i>Nasella lepida</i>	9
<i>Bromus carinatus</i>	7
<i>Eschscholzia californica</i>	5
<i>Lupinus succulentus</i>	5
<i>Achillea millefolium</i>	5

Total: 60 lbs PLS/ac

Seeded area is 2,915 sq ft or 0.06 acres

### Source:

Pacific Coast Seed  
533 Hawthorne Place Livermore, CA 94551  
Ph (925) 373-4417 Fx (925) 373-6855.



Construction Documents
Date 19 Apr 2010
Scale no scale
Drawn s3d
Job American Rivers
Sheet

### PLANTING DETAILS

Nevada County Rood Center  
950 Maidu Ave Nevada City, CA  
APN: 05-020-17



**Tallac**  
Applied Ecology & Design

602 Redbud Way Nevada City CA 95959  
Tel 530.545.3718 Fax 530.470.0451

Contact: Sheri Brown Dion  
E-mail: sheribrowndion@tallac.net

www.tallac.net

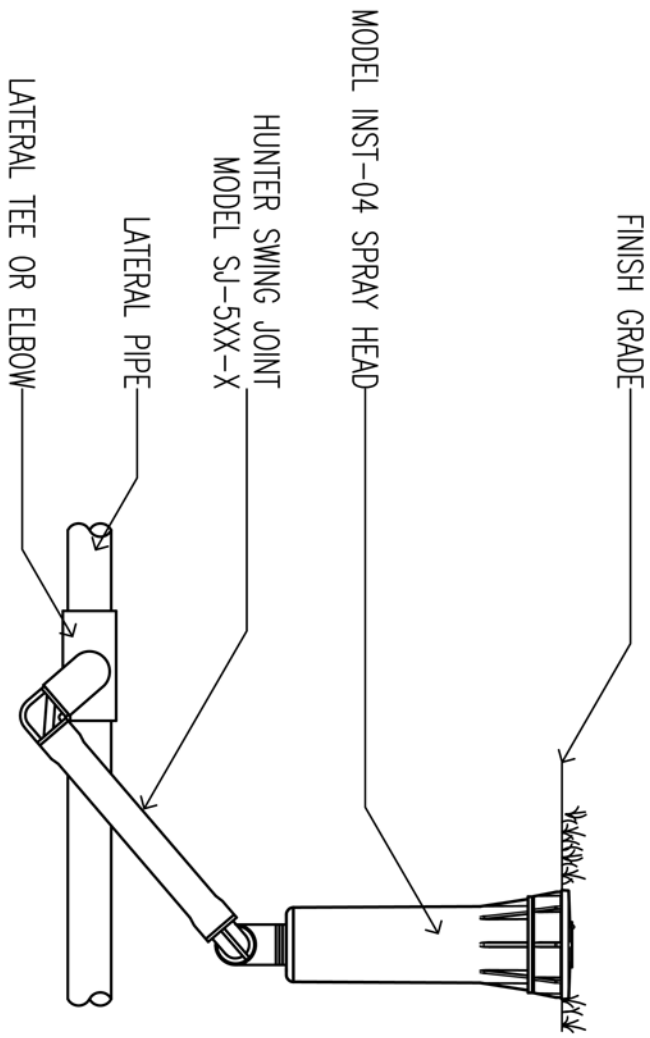


**American Rivers**  
Thriving By Nature

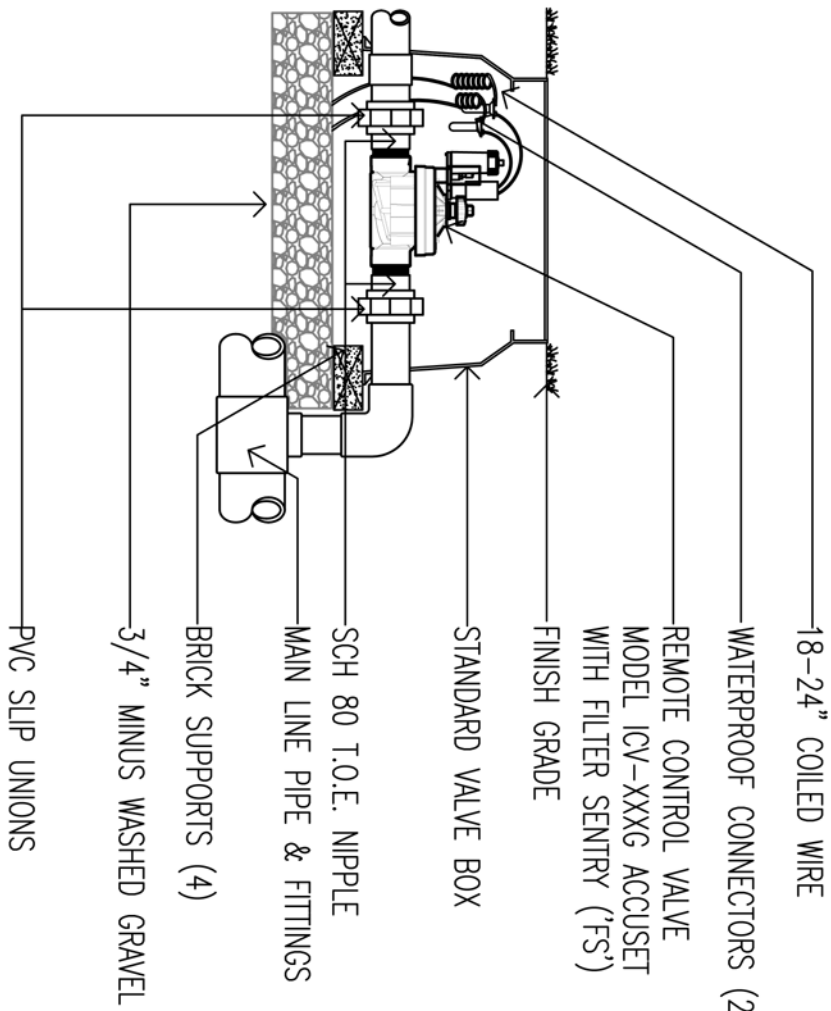


INTEGRATED ENVIRONMENTAL  
RESTORATION SERVICES, INC.

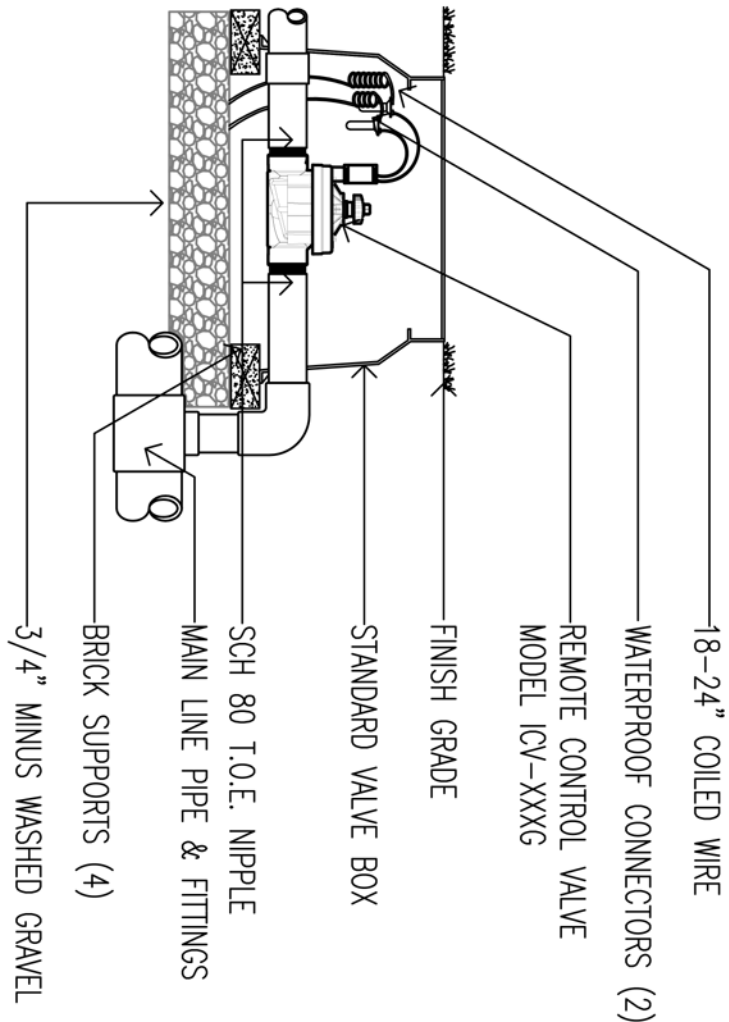




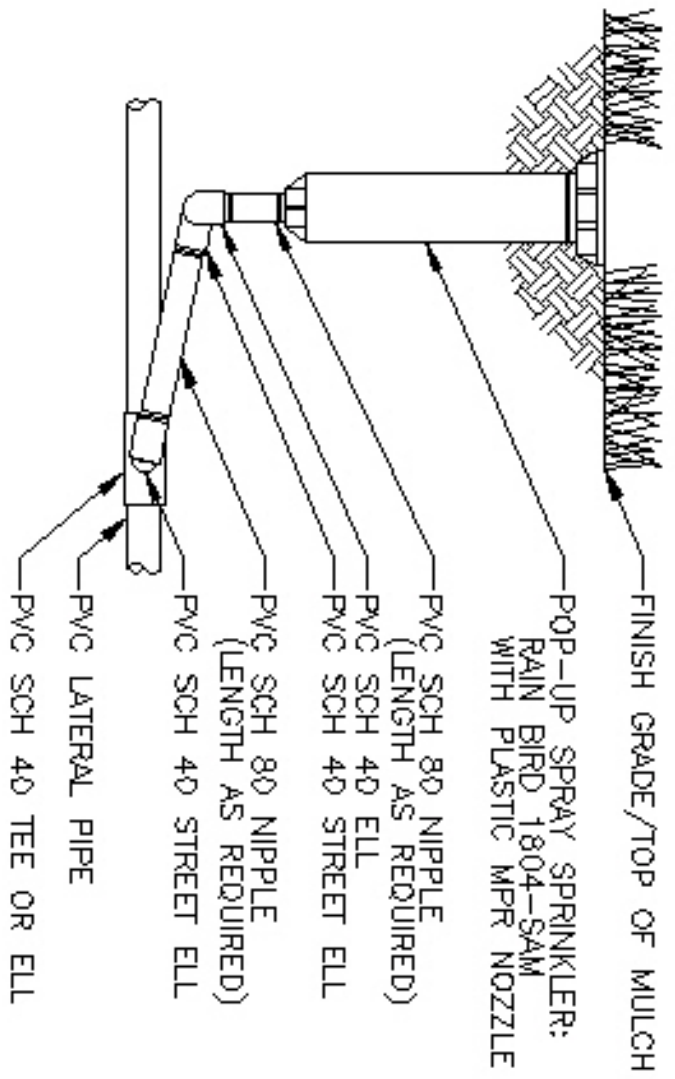
1 Hunter Sprinkler w/Swing Joint



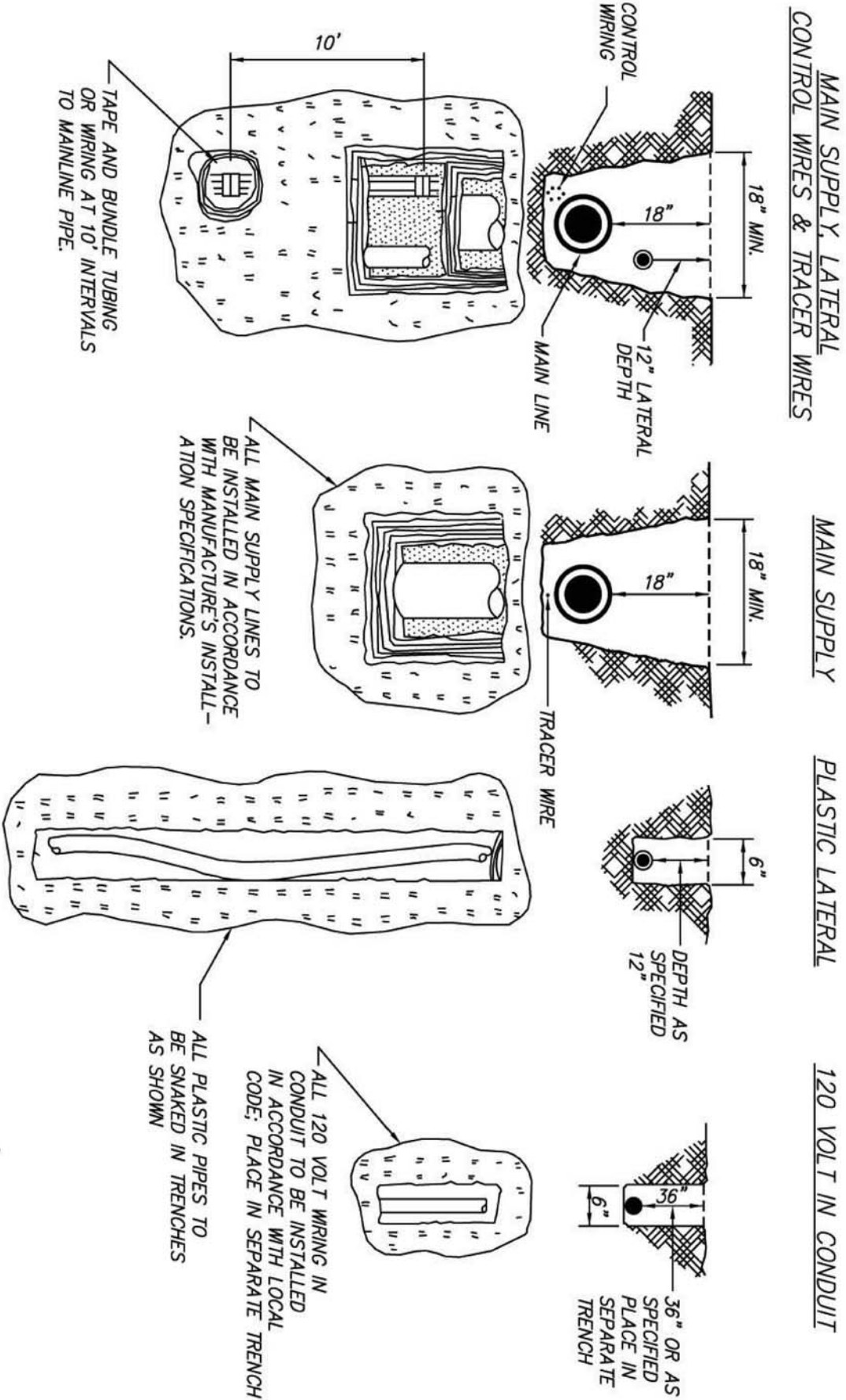
2 Hunter ICV Valve w/Accu-Set Pressure Regulator  
Scale: 1" = 1' PVC Slip Union Construction



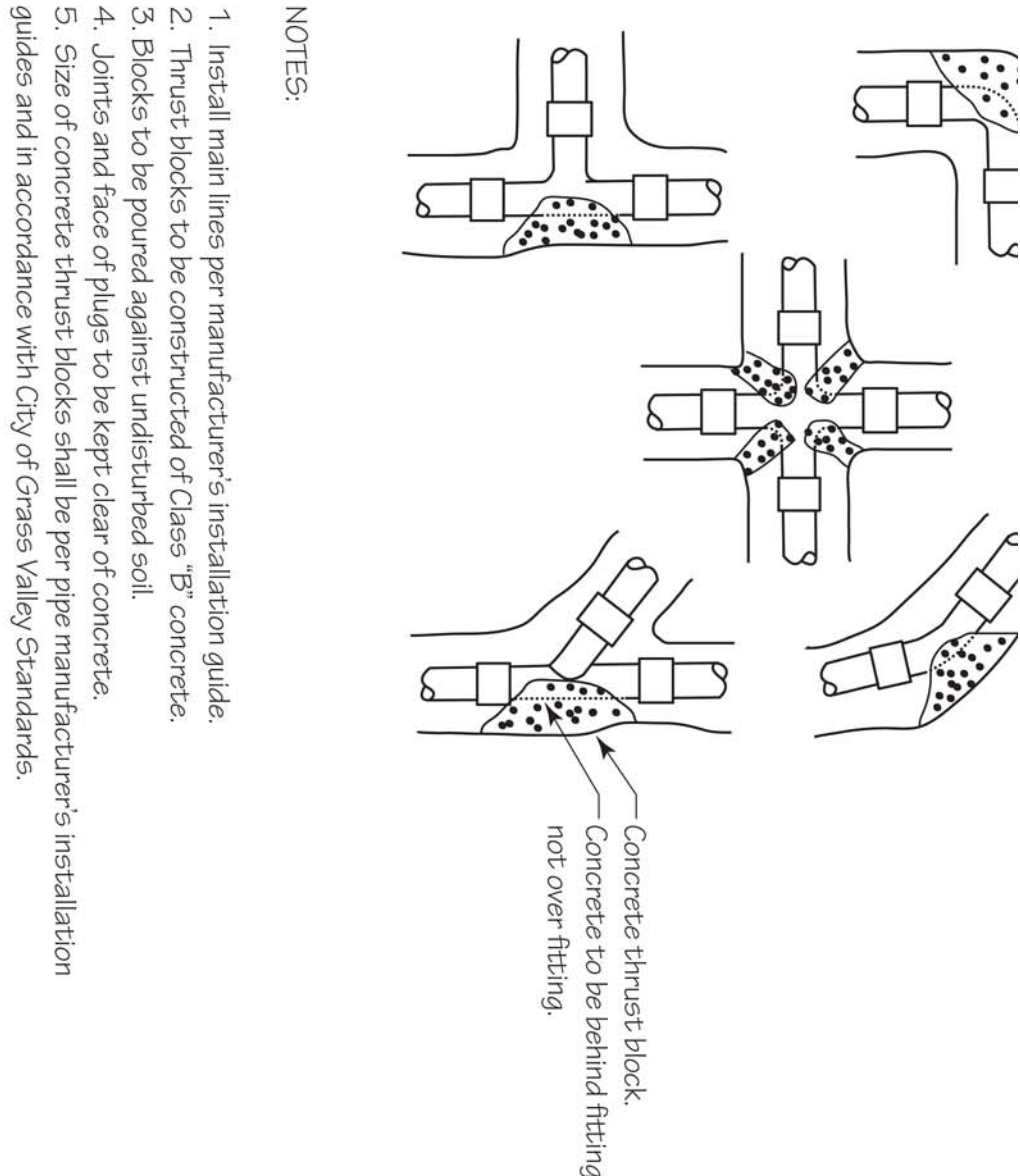
3 Hunter ICV Valve w/Accu-Set Pressure Regulator  
Scale: 1" = 1' T.O.E Nipple Construction



4 Rainbird Sprinkler w/Swing Joint

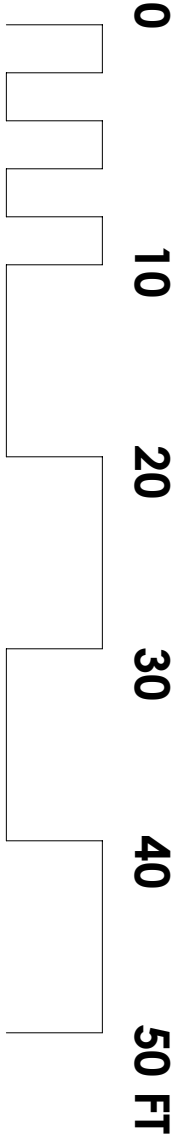
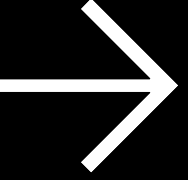


5 Irrigation Pipe Trenching



- NOTES:
1. Install main lines per manufacturer's installation guide.
  2. Thrust blocks to be constructed of Class "B" concrete.
  3. Blocks to be poured against undisturbed soil.
  4. Joints and face of plugs to be kept clear of concrete.
  5. Size of concrete thrust blocks shall be per pipe manufacturer's installation guides and in accordance with City of Grass Valley Standards.

6 Thrust Blocks



Construction
Drawing
Date 22 Apr 2010
Scale 1/4" = 10' 0"
Drawn s3d
Job American Rivers

Sheet

13

of 6 sheets

## IRRIGATION DETAILS

Nevada County Rood Center  
950 Maidu Ave Nevada City, CA  
APN: 05-020-17



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RESTORATION SERVICES, INC.